DOCUMENT RESUME

ED 348 117 JC 920 418

TITLE	Extending the Concept and Practice of Classroom Based Research to California Community Colleges. Final Report.
INSTITUTION	Sacramento City Coll., CA. Learning Resources Div.
SPONS AGENCY	California Community Coll. Fund for Instructional Improvement.
PUB DATE	Jan 92
NOTE	226p.; Cover title: Consortium Project Extending the Concept and Practice of Classroom Research Report, with American River College, Cosumnes River College, San Joaquin Delta College, Solano College, Yuba College. For related documents, see ED 324 063-064, and ED 324 066. Final report prepared by Kirk Wiecking, Gene Sellers, and Donna Milanovich.
PUB TYPE	Reports - Research/Technical (143)
EDRS PRICE	MF01/PC10 Plus Postage.
DESCRIPTORS	Black Students; *Classroom Research; *Classroom Techniques; Cognitive Style; Community Colleges; Computer Literacy; Computer Uses in Education; Cooperative Learning; Dance Education; Distance Education; English (Second Language); *Instructional Effectiveness; *Instructional Improvement; Intercultural Communication; *Learning Strategies; Remedial Mathematics; Remedial Reading; School Holding Power; *Teaching Methods; Two Year Colleges; Two Year College Students; Writing Exercises
IDENTIFIERS	*California

ABSTRACT

With support from the California Community College Fund for Instructional Improvement, 14 classroom-based research studies were conducted in fall 1991 at American River College (ARC), Consumnes River College (CRC), Sacramento City College (SCC), San Joaquin Delta College (SJDC), Solano Community College (SoCC), and Yuba Community College (YCC). This compilation contains an opening report on the project's background, a summary evaluation of the studies, a budget review, and 14 project reports. These reports are: (1) "Learning Style and the Distant Learner," by Richard J. Dowdall (SCC); (2) "Investigating Some Strategies To Lower Attrition in Biology," by Alyce Fiedler and George Bleekman (ARC); (3) "Cooperative Learning in a Developmental Reading Course," by William Morris (ARC); (4) "Grammar-Checking Software in the Writing Lab," by Phil Hutcheon (SJDC); (5) "The CRC Penpal Project: Fostering Cross-Cultural Interaction," by Marlo McClurg; (6) "Underline the Subject Once; the Verb Twice, Or Grammar: What Good Is It? Language Study in Composition Courses," by Cynthia Cilensek Kellogg (YCC); (7) "Assigned Topics vs. Student Topics: For Developing Fluency in ESL (English As a Second Language) Students under Timed Writing Conditions," by Charles F. Honnold (ARC); (8) "Computer Skills in the Fashion Industry: A Comparison of the Attributes of Community College Students and the Needs of Employers," by Peggy Gorbach (SoCC); (9) "An Initial Investigation into Why More African-American Students Do Not Take Foreign Language Classes," by Ramiro Canto-Lugo and Matthew J. Reich (YCC); (10) "Does the Graphing Calculator Enhance Learning in Precalculus?" by Katherine McLain (CRC); (11) "Laboratory Activities in Developmental Mathematics," by Kent M. Neuerburg (CRC);

(12) "Ongoing Semester Use of the Dunham Dance Technique To Improve Student Preparedness for Dance," by Shirley Brown (SCC); (13) "English 1/History 17 Essay," by Susan Messina and Diane White (SoCC); and (14) "Feedback Loop as a Mastery Learning Teaching Concept To Improve Student Learning," by Carole Jarrett (SoCC). (PAA)

****
*   Reproductions supplied by EDRS are the best that can be made   *
*   from the original document.   *
****

Sacramento City College
Learning Resources Division

"PERMISSION TO REPRODUCE THIS
MATERIAL HAS BEEN GRANTED BY

J. P. Swedlow

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)
☐ This document has been reproduced as received from the person or organization originating it.
☑ Minor changes have been made to improve reproduction quality
- Points of view or opinions stated in this document do not necessarily represent official OERI position or policy

ED348117

CONSORTIUM PROJECT EXTENDING THE CONCEPT AND PRACTICE OF CLASSROOM BASED RESEARCH REPORT

With
American River College
Cosumnes River College
San Joaquin Delta College
Solano Community College
Yuba College

JC 920 418

Funding in part by the Fund for Instructional Improvement
California Community College Chancellor's Office.

1991

BEST COPY AVAILABLE

SACRAMENTO CITY COLLEGE

LEARNING RESOURCES DIVISION

CLASSROOM BASED RESEARCH

FINAL REPORT

FUNDED IN PART BY THE CALIFORNIA COMMUNITY COLLEGE
FUND FOR INSTRUCTIONAL IMPROVEMENT

JANUARY 1992

FINAL REPORT PREPARED BY:

Kirk M. Wiecking
Instructional Developer
Project Director

Gene Sellers
Mathematics Instructor
Research Advisor

Donna L. Milanovich
Secretary

SACRAMENTO CITY COLLEGE

EXTENDING THE CONCEPT AND PRACTICE OF CLASSROOM BASED RESEARCH TO CALIFORNIA COMMUNITY COLLEGES

FINAL REPORT

RESEARCH FACULTY

AMERICAN RIVER COLLEGE

George Bleekman
Alyce Fiedler
Charles Honnold
William Morris

SAN JOAQUIN DELTA COLLEGE

Phil Hutcheon

SACRAMENTO CITY COLLEGE

Shirley Brown
Richard Dowdall

COSUMNES RIVER COLLEGE

Marlo McClurg
Katherine McLain
Kent Neuerburg

SOLANO COMMUNITY COLLEGE

Peggy Gorbach
Carole Jarrett
Susan Messina
Diane White

YUBA COMMUNITY COLLEGE

Ramiro R. Canto-Lugo
Cynthia Cilensek Kellogg

JANUARY 1992

EXTENDING THE CONCEPT AND PRACTICE OF CLASSROOM BASED RESEARCH TO CALIFORNIA COMMUNITY COLLEGES

FOREWORD

This report on classroom based research represents the final results of a project supported in part by the Fund for Instructional Improvement California Community Colleges during 1990-1992. The purpose of this project was to conduct a minimum of 14 classroom based research studies with participating faculty from Northern California Community Colleges.

The intent of classroom based research is direct faculty participation in research to improve teaching and learning. It is based on the premise that instructors do have the opportunity, through research, to identify, study, analyze, implement, and assess instructional strategies that improve teaching and learning.

The results of this project serve as evidence of the dedication, professional expertise, and sincere desire of community college instructors to improve instruction. The material presented in this report represents individual and collaborative efforts of the project director, research advisor, and research faculty from the participating faculty.

SACRAMENTO CITY COLLEGE

LEARNING RESOURCES DIVISION

CLASSROOM BASED RESEARCH

TABLE OF CONTENTS

Page (s)

FOREWORD i

EXTENDING THE CONCEPT AND PRACTICE OF CLASSROOM BASED RESEARCH --

FINAL REPORT

Description 1 - 5

Available Material 6

Evaluation 7 - 11

Budget 12 - 13

FACULTY RESEARCH REPORTS

BEHAVIORAL and SOCIAL SCIENCE

Page (s)
Learning Style and the Distant Learner 15 - 31

Richard J. Dowdall -- Sacramento City College

BIOLOGY

Investigating Some Strategies To Lower Attrition in Biology 32 - 43

George Bleekman and Alyce Fiedler -- American River College

ENGLISH

Cooperative Learning in a Developmental Reading Course 44 - 65

William Morris -- American River College

Grammar-Checking Software in the Writing Lab 66 - 70

Phil Hutcheon -- San Joaquin Delta College

The CRC Penpal Project: Fostering Cross-Cultural Interaction 71 - 91

Marlo McClurg -- Cosumnes River College

Underline the Subject Once; The Verb Twice 92 - 107

Cynthia Cilensek Kellogg -- Woodland Campus Yuba College

ENGLISH AS A SECOND LANGUAGE

Assigned Topics vs Student topics: For Developing Fluency in ESL Students Under Timed Writing Conditions 108 - 120

Charles Honnold -- American River College

FAMILY and CONSUMER SCIENCE

Computer Skills in the Fashion Industry 121 - 128

Peggy Gorbach -- Solano Community College

FOREIGN LANGUAGE

An Initial Investigation Into Why More African-American Students Do Not Take Foreign Language Classes 129 - 132

Ramiro Canto-Lugo and Matthew J. Reich --
Yuba Community College

MATHEMATICS

Does the Graphing Calculator Enhance Learning In Precalculus? 133 - 138

Katherine McLain -- Cosumnes River College

Laboratory Activities in Developmental Mathematics 139 - 143

Kent M. Neuerburg -- Cosumnes River College

PHYSICAL EDUCATION

Ongoing Semester Use of the Dunham Dance Technique to Improve Student Preparedness for Dance 144 - 154

Shirley Brown -- Sacramento City College

DUAL DISCIPLINES

English 1 / History 17 Essay 155 - 190
Susan Messina and Diane White -- Solano Community College

MASTERY LEARNING/TEACHING

Feedback Loop as a Mastery Learning Teaching Concept to Improve Student Learning 191 - 200

Carole Jarrett -- Solano Community College

CALIFORNIA COMMUNITY COLLEGES
CHANCELLOR'S OFFICE
FUND FOR INSTRUCTIONAL IMPROVEMENT

FINAL REPORT
FOR
EXTENDING THE CONCEPT AND PRACTICE OF CLASSROOM BASED RESEARCH TO CALIFORNIA COMMUNITY COLLEGES

1990 - 1992

1. Provide a brief description of the project and the activities which were actually carried out to bring the project to completion. If the project had to be adjusted due to reduced funds or other factors, describe the project in its adjusted form and not as originally described in your application for funding. Also specify when the project actually began and when it was actually completed.

This project is a direct result of previous classroom based research projects supported by the Fund for Instructional Improvement and Sacramento City College. During 1985-1990 Sacramento City College has involved over twenty faculty in conducting classroom research studies. Due to the continued success of this endeavor this project was intended to extend the practice to other faculty at nearby community colleges.

The purpose of this project was to improve teaching and learning through classroom based research. It is based on the premise that careful analysis of instructional techniques, the classroom environment and student outcomes, through research, can have a positive impact on instructional improvement and foster faculty development and renewal.

Through an effort initiated by Sacramento City College, the project goals included: 1) an increase in faculty trained to conduct classroom based research, 2) further development of classroom based research activity throughout the community college system, 3) additional resource materials and models on classroom based research for community college faculty, 4) dissemination of results to encourage institutional interest in classroom research studies, and 5) implementation of research studies at other community colleges.

The major problems addressed in this project included: a) the lack of ongoing classroom research in the community college system; b) the challenge to provide educational excellence in teaching; c) the need to implement teaching strategies for improving instruction and learning; and d) the need to secure essential resources for faculty development and renewal.

The desired outcomes for this project consisted of: a) an increase in faculty trained to conduct classroom research; b) development and implementation of a minimum of fourteen classroom based research studies; c) an increase in available resource materials for community college research; and (d) improved teaching, student success, and faculty development. The project was conducted with a project director and administrative, professional, and support staff from Sacramento City College.

To implement this project, a series of activities were carried out to achieve specific objectives and to complete the project.

- Based upon previous project experience a project workplan was established and implementation activities were initiated.

- A project team for coordination of project activities was established, and included the following Sacramento City College staff:

  Administrator: Marguerite Jones
  Project Director: Kirk Wiecking
  Research Advisor: Gene Sellers
  Project Secretary: Donna Milanovich

Through telephone communication, written correspondence, and document exchange, the following tasks were carried out:

- Project information was compiled, an application form designed and produced, and a letter of invitation (Exhibit A - Introduction Materials) to participate was directed to Research officers, Staff Development officers, and Vice Presidents of Instruction at the following colleges:

  American River College

  Cosumnes River College

  San Joaquin Delta

  Sacramento City College

  Sierra College

  Solano College

  Yuba College

Through follow-up telephone conversations with appropriate college administrators and interested faculty, the grant information was reviewed at each college and discussed with the project director to establish an understanding and agreement on project goals, objectives, activities, implementation strategies, timelines, resources, evaluations, and reporting requirements. Specific areas that were discussed included the following:

- Review of project intent and scope
- Recommendations for types of classroom research studies appropriate to project intent
- Discussion of information items on the concept and practice of classroom research
- Review of strategies to promote and encourage faculty participation
- Discussion of general criteria for selecting classroom research studies
- Clarifying the roles and responsibilities of the project director, research advisor, and participating research faculty
- Establishing communication procedures
- Explanation of project timelines and schedule deadlines
- Review of budget allocations for research participants
- Distribution of an application to faculty interested in conducting a classroom based research study
- Review of training session topics

In addition, distribution of previous classroom research projects and final report products, produced by Sacramento City College, served as useful examples of classroom research studies and helped to clarify project expectations.

- Based upon previous experience, necessary resources were identified and procedures outlined for project operations. Faculty applications to conduct classroom based research studies were received from six community colleges, and select criteria was used to choose fourteen faculty members to conduct the research studies. For the selection process, consideration was given to: a) appropriateness of the research proposal, b) feasibility and practicality of conducting the proposed study, c) diversity of proposed study compared with all applications, d) equitable representation of campus disciplines or topic issues, and e) completeness of the proposed study.

- The project team from Sacramento City College conducted the application review and selection process. Faculty were then selected to conduct the classroom based research studies (Exhibit B, List of Selected Studies). Once faculty were identified they were notified and invited to the first planning and work session.

During the next six months four group meetings were conducted (Exhibit C Agendas) and individual consultation sessions were held with research faculty. The four group sessions are summarized as follows.

1. Orientation - Project Direction- Research Study
2. Research Training - Define the Question
3. Methodology - Problem Solving
4. Statistical Treatments - Final Report

One on one advisement was conducted as part of the group workshop agenda, by telephone and office visits and in some instances, the project director and research advisor traveled to visit the research faculty at their respective campuses.

Dr. Richard Rasor, Instructional Researcher from American River College, made a presentation and answered individual research questions during the second work session. His presentation and guidance was crucial to ensuring the success of the project and providing research faculty with the guidance needed to frame the research structure and design for each participating faculty member.

During this session, Dr. Rasor distributed a first draft copy of his Instructional Research Handbook and reviewed the important aspects of Instructional (Classroom), Research with the participants. Based upon Dr. Rasor's presentation, many of the faculty were able to improve upon initial designs to establish a sound research study that was manageable and meaningful. It should be noted that Dr. Rasor is a leading authority on the practice of instructional research and the group was very fortunate to benefit from his experience and expertise.

- Fourteen classroom research studies were conducted during Fall 1991. The primary activities to complete this objective consisted of group meetings and training, one-to-one consultation sessions with the internal research advisor and project director, and most important, research faculty completing their tasks at their respective colleges. Project benchmarks were used to ensure the progress of the study, to process and prepare necessary data, to address problems, and to discuss methods to handle data, analyze results, and write final reports for individual studies.

- Resource materials were gathered and distributed as part of the project. This was an ongoing process which consisted of reviewing and compiling select information on the topic of classroom research, distributing this to participants, and discussing information and data related to the classroom research studies being conducted. Other materials consisted of data collected for the studies, and information on each individual study which includes a description of the study, an explanation of the activities carried out, presentation of results, analysis, limitations and/or problems with the study, and recommendations for replication and/or further investigation. In addition, faculty were encouraged and submitted personal observations about their efforts at the end of their study report. Final reports for each study are contained in this report.

- Due to the positive response and continuing high level of interest in this project, staff in the Learning Resources Division at SCC are working with the SCC research office and select campus committees to institutionalize classroom based research. In addition, other colleges that participated in this project are being encouraged to submit proposals to the California Community Colleges' Chancellor's Office, Fund for Instructional Improvement to work with other colleges. Their proposals would be intended to extend the practice of classroom based research studies to additional community colleges and to involve other college faculty in replicating previously conducted studies at Sacramento City College and/or to conduct new studies.

- At the conclusion of the project an evaluation form (Exhibit D, Evaluation Instrument) was provided to the participating faculty on the project. A summary of the responses and other evaluative comments are reported in the evaluation section (Question #3) (see also, Exhibit E, Summary Evaluation) of this final report. Finally, as a result of the growing interest in classroom research, Sacramento City College continues to promote instructional research at SCC and throughout the Los Rios Community College District.

- Project results have been compiled for dissemination to promote replication. All information is packaged for distribution to California community colleges and other appropriate educational agencies and institutions.

- Adjustments to the original project included: 1) budget reductions for project expenses, and 2) a time extension on the project completion date. This was necessary because of complications of involving multiple colleges. The project was initiated in October 1990 and completed in January 1992.

2. Provide a list and a copy of the final product of this project. Although materials developed with funds from the California Community College's Fund for Instructional Improvement may not be distributed for profit to California institutions, it is appropriate for such materials to be made available at cost of production.*

This final report as submitted in its present form is available upon request. Other materials that will be provided upon request include:

1) A copy of previous classroom research projects conducted at Sacramento City College including:

   - Classroom Based Research Final Report 1985-1987 Sacramento City College Fund for Instructional Improvement Project

   - Classroom Based Research Final Report 1987-88 Sacramento City College SCC Staff Development Project

   - Classroom Based Research Final Report 1988-89 Sacramento City College Fund for Instructional Improvement

   - Classroom Based Research Final Report 1989-90 Sacramento City College Human Resources Development Committee Project

---

* Under no circumstances should a charge be made for content of materials, only for the actual cost of paper or other material, copying expense, mailing, etc.

3. Provide a detailed evaluation of the project. This evaluation may require several pages and should include specific references to those project activities which you think were effective and those which were not effective. Include in your assessment of the project specific recommendations to those who may wish to replicate the project on their own campuses. The evaluation may have been carried out by project staff and/or an outside evaluation on the evaluation and the procedures.

The methods of evaluation used for this project addressed process, product and impact. Process evaluation was concerned with successful implementation of the project and evaluation of the project by the participants. Product evaluation was concerned with the results of the project as evident from the collection, development, and production of material resources. This includes support materials and documented project results. Impact was concerned with the benefits to participating faculty and improvement of the teaching learning process --- Instructional Improvement.

The following narrative provides an analysis and evaluation of project activities and results.

- To begin the project, the first task was to establish a project team. Based upon previous projects this task was completed and consisted of Sacrament City College staff involved in previous classroom research projects. This is always an important starting point since organization and gaining participation was critical to ensure the success of the project.

  It must be stressed that convening a group of college faculty with different schedules and from different institutions does present certain problems, and this is especially true at the beginning of a new school year. As a result, a standardized meeting schedule was implemented, and mail and telephone communication was used to fill any gaps.

- The next task was to set a direction, determine protocols and establish procedures for project operations. This activity was concerned with communication, logistics, operations, and implementing a momentum for the project. Through consultation and based upon prior experience, ideas were discussed as to what type of classroom based research activity would have the potential to be of the most benefit to the participating institutions, faculty, and students. Since classroom research continues to be an emerging concept at the community college and because faculty awareness and interest is still growing, this aspect of the project generated a diversity of ideas. The final outcome of this activity was an agreement to adapt and modify previous strategies to encourage faculty participants to conduct classroom based research studies.

Logistics for the project were managed through the Learning Resources Division and Administrative Staff Development Office at SCC, which enhanced the project operations since it was not necessary to establish a college office to oversee the project activities. This is an extremely important element for any project since administrative oversight, reporting, coordination, and information dissemination can follow a regularly recognized institutional process.

Since grant projects at SCC are managed as part of an administrator's assignment with no clerical support for grant activity, the grant provision for funding clerical support was a very important aspect in ensuring the success of the project. In addition to routine correspondence and record keeping, the clerical support was instrumental for the on-going processing of information which was necessary to keep the grant project progressing. Also, this support allowed for the professional preparation of the final report.

- Announcing opportunities for faculty to apply to conduct classroom based research studies was a complicated phase in this project because of involving multiple colleges. This was achieved with some difficulty due to working with individuals unknown to the project director and working through individual campus procedures for this project. However, once the promotion efforts were initiated, it generated interest and discussion from a variety of individuals at each college. Using examples from previous projects, a simple single page announcement and application form was used to solicit participation from faculty. Based upon previous experience it was understood that making the application process simple would encourage faculty with all levels of expertise to respond. It was understood that the concept of research had the potential for screening out very good ideas as some faculty might think they were not adequately prepared to conduct classroom research.

- Selecting research studies from the applications required a simple review and assessment of the applications and then a meeting to discuss selection of the studies. This task was completed with minimal difficulty. Previously established criteria facilitated the selection process. This criteria included 1) appropriateness of the proposed study, 2) feasibility and practicality of conducting the proposed study, 3) diversity of the proposed study compared with all applications, 4) equitable representation of disciplines or topic issues, and 5) thoroughness of the completed proposal. The assistance of the research advisor was critical in this process. Personal letters were sent to each person who applied to conduct a study informing them of the outcome of the selection.

- Based upon previous experience it was understood that the research advisor available to offer on-going assistance was most beneficial and effective for research faculty.

  Comments from the research faculty support the practice to work with someone in research, since assistance is available for difficult questions. Research faculty appreciated and enjoyed the opportunity for discussion which allowed them to address issues of concern and then to proceed with the next phase of their study.

  Group discussion and individual consultation sessions among research faculty, the project director, and the research advisor also proved to be a very worthwhile activity for the project. These sessions provided for sharing of ideas, updates on progress, raising problems, finding solutions, advancing the work tasks, and provided a productive and stimulating environment for accomplishing individual tasks. The cross fertilization of ideas among various faculty and disciplines to improve teaching and learning was positive.

- Providing for the clerical aspects of the project was determined to be significant. In addition, research reports needed to have data presented in a manner that the research advisor and faculty could work with in the analysis of the data. This support was identified as essential for the successful completion of the project. Quick processing maintained the momentum necessary to compete the project in a timely and professional fashion.

- The classroom research studies were conducted by each of the individual research faculty, and the results of their efforts are reflected in the individual papers included in this report. Problems and limitations identified in the faculty papers provide evaluative information on the study. In addition, the individual research reports serve as the final product of the classroom based research studies for an overall evaluation of the faculty work.

- Another item to be considered in evaluation of this project concerns the depth and quality of resource materials developed as a result of this project. The final report, faculty research reports, and other documentation serve as evidence of the value of the materials which resulted from the project. In addition, this complete final report provides useful information for anyone interested in learning more about classroom based research or interested in implementing a research study.

- Overall, institutions concerned with implementing or replicating a project such as this should give careful attention to administrative leadership; careful scheduling due to the nature of research usually requiring a full term; adequate clerical assistance; availability of a research advisor/expert; and project coordination. Finally, institutional recognition and support is essential in order to gain faculty interest and continued participation.

- This Classroom Research Project conducted by Sacramento City College with other Community Colleges was a success. Although there may have been a few logistical problems, the final results certainly made the efforts most worthwhile. To improve teaching and learning, revitalize faculty, and to supplement staff development programs, Classroom Based Research is a demonstrated activity which has the potential to achieve these goals.

- When Sacramento City College faculty first began conducting classroom research in 1985, there was minimal activity in this area on a state wide basis. Since this time, and perhaps due to some of the dissemination efforts of Sacramento City College, the concept and practice of Classroom Research has continued to expand to other Community Colleges.

A major catalyst for this awareness must also be attributed to K. Patricia Cross and Thomas Angelo from the University of California at Berkeley. Their combined efforts in research, publishing and presenting on classroom assessment techniques has contributed significantly to bringing this issue to the forefront of education.

In a presentation by Dr. Cross titled "Improving Learning in Community Colleges" at the League for Innovation Conference on October 8, 1986 in Miami, Florida, she addresses the need for classroom research. She suggest that not just what is taught is important, but how it is taught is critical; that there will continue to be discussion as to what constitutes good or effective teaching, which has been based primarily on instructor ratings and not student outcomes; and that there is need to identify better measures and criteria for measuring quality education. In reviewing the need for improved methods or standards for evaluating the quality of instruction, Dr. Cross identifies three major factors which she indicates are missing from available literature.

First, information on what teachers are trying to accomplish, what they want students to learn from them, and what are they doing in the classroom. She suggest more attention should be given to what teachers are trying to do. Framing the research question is intended to address this need.

Second, that there is a gap between research and practice because there is a need for a "constructive approach" to apply research to improve practice. Dr. Cross suggests "that the exchange of knowledge from many specific classrooms will give teachers more useful insight into the teaching/learning process than the search for generalizations across a representative sample of students, teachers, and subject matters." Also, that knowledge gained from doing research is more likely to be used than what is gained from reading about research. Classroom research studies by individual faculty members presents an opportunity to directly respond to this issue.

The third item that is missing from the literature is on "how to conduct research in and on the classroom." Dr. Cross suggests that the most useful research will be done by teachers in their own classrooms. Training instructors in classroom research addresses this need. Also, this approach will help the teacher to evaluate their effectiveness, foster intellectual stimulation, and will provide professional renewal for teachers. Classroom research demonstrates this is an achievable goal.

Since 1986, Dr. Cross and Dr. Angelo have both been actively promoting classroom research in California Community Colleges and in higher education nationwide. They have published one book, Classroom Assessment Techniques, and are working on a second book which will contain examples of classroom research studies which are "discipline specific." Although this project does not exactly follow the Cross/Angelo model (although they have certainly influenced the direction) the results of this project will contribute to the information and resources available on classroom research.

It is now evident that many colleges are becoming involved in classroom assessment and research, and that many different types of institutional models for classroom research are evolving. Continued activity will further improve instruction and learning in the community colleges. Clearly, classroom research studies, supported by the California Community Colleges' Chancellor's Office, Fund for Instructional Improvement, are contributing to this growing body of knowledge.

* Through the initial Fund for Instructional Improvement grant (1985-87) awarded to Sacramento City College, we learned much about the concept of classroom research and the tremendous amount of work still to be accomplished. In addition, studies funded by the SCC Staff Development Committee (1987-88), the Fund for Instructional Improvement Project (1988-89), the SCC Human Resources Development Committee (1989-1990) and this FII project (1990-1992) reinforce the fact that faculty are very interested in this concept and that they are willing to engage in classroom research with appropriate resources and assistance. Also, as a result of this project, Sacramento City College continues to advocate for the support of classroom based research through internal Human Resource Development activity and to work toward expanding the concept and practice. Also, other involved colleges in this project continue to promote and foster faculty involvement in classroom research through inservice/Flex instructional improvement activities and to explore the potential of continued fiscal support through Human Resource Development plans and activities.

4. Provide a detailed itemization of budget expenditures during the period for which the project was funded. Use the budget summary attached to report expenditures. On a separate piece of paper explain how funds were spent within each of the budget categories.

1991-92 Fund For Instructional Improvement (FII)
Expenditure Statement

Sacramento City College
Budget Detail

FII Funds

	TOTALS
SALARIES	
A. FACULTY STIPENDS	7,371.00
Paid stipends to research faculty for conducting classroom research and completion of paper on study. And one guest advisor on research design training.	
B. RESEARCH ADVISOR	2,285.00
Compensation for time spent on project activities, such as individual consultation, assistance with research design, statistical treatments, analysis interpretation and presentation.	
C. PROJECT DIRECTOR	2,904.00
Compensation for time spent on project activities, such as, coordination, information dissemination, communication, assistance with preparation of studies, and completion of final report writing and editing.	

D. SECRETARIAL 2,437.22

Compensation for time spent on clerical activities, such as, typing project correspondence, faculty studies, and completed final report. Also, duplicating, graphics and maintaining budget accounts.

SUPPLIES

A. MATERIALS / OPERATIONS 479.55

Funds expended for reference materials, books, abstracts and other print materials, such as, article reprints; items such as, paper, computer disks, ribbons, binders, graphic art material and duplication costs for faculty studies, and project final report.

CONTRACT (SERVICES) 6,000.00

Paid stipends to non Los Rios research faculty for conducting classroom research and completion of paper on study.

CONFERENCE, TRAVEL 85.00

Funds expended for airfare, mileage, overnight accommodations/per diem expenses, conference registration for project participants to meet and confer, and conference presentation.

TOTAL 21,561.77

LEARNING STYLE AND THE DISTANT LEARNER

A RESEARCH PROJECT CONDUCTED BY
RICHARD J. DOWDALL, PSY. D.
BEHAVIORAL AND SOCIAL SCIENCES DIVISION
SACRAMENTO CITY COLLEGE
FALL SEMESTER 1991

OVERVIEW

Introduction/Background

As times change, so do the characteristics of the student population. A list of trends and their implications published by the State Chancellor's Office (1989) indicates that the fastest growing cohort in California is the 35-54 age group. The increased enrollment of older students will emphasize needs differing from the 18 year old population. A great number of the older students work on a full-time basis and are also parents. Because of the demands on their time, these students are interested in off-campus classes, at flexible non-work hours. This expanding group of students has been called the *New Majority* (Ehrmann, 1990).

Telecourses and other forms of distance learning will play a more important role in the course offerings of community colleges during the 1990's due to budget limitations and limited on-campus enrollment, limited parking, rising transportation costs, and the needs of New Majority students to coordinate a college education with their work schedule and family responsibilities. Students with impairments to their mobility could also benefit from distance learning.

Studies by Ronald Brey (1984) and Valerie Crane (1988, 1985) provide a rather clear picture of the typical telecourse student. Approximately half were over 35 and currently married with at least one dependent; two-thirds were female; 75-80% were matriculating for a degree; 15% had not had any formal education for 6 years or more (re-entry students); 14% were minorities; and 50% had taken an off campus or distant learning course in the past. Students found telecourses to be as difficult and as challenging as on-campus courses. This student perception was validated by a study of grades for traditionally taught and television-based courses, which showed that grades were comparable.

Sacramento City College currently offers transfer level courses by television. Telecourses are convenient and allow students to fit course activities into their work and family schedules.

Problem

Psychology 1 was adapted to a telecourse format during the Spring semester of 1990 (Dowdall, Spring 1990) and offered the following semester. A study of that first semester telecourse (Dowdall, Fall 1990) discovered a 64% drop rate for Psychology 1 telecourse students, which was twice the drop rate (36%) for an on-campus section of Psychology 1. Other data gathered during that semester indicated that students who completed the Psychology 1 telecourse were older and had completed twice as many previous college units as those who dropped. These surviving students also reported that it was essential to be a self-motivated learner with discipline and well-developed study skills to do well in a telecourse. Those students who barely survived in the telecourse also wanted to have more classroom contact with the instructor and fellow students because they learned better that way. This classroom based research project was designed to investigate the possibility that learning style might influence whether a student selected a telecourse, stayed in that course through mid-term, and maintained a C or better grade by mid-term.

Hypothesis

It was hypothesized that learning style, as measured by the Learning-Style Inventory (LSI) (Kolb, 1981), might be a contributing factor to selection and retention in a Psychology 1 telecourse. Within the diverse community college student population, differences in learning style may be related to mid-term grades and drop rate.

METHODOLOGY

Design

Both Telecourse and On-Campus students completed the Learning-Style Inventory (LSI), and a Student Data Sheet that gathers demographic information (age, sex, employment), as well as academic information (number of college units completed, proposed major, previous psychology course, etc.). These two instruments were administered to the Telecourse Students at the orientation session, and during the second class session for the On-Campus Students

Both groups had the same assignments: reading from Psychology by Wade & Tavris; reading from the Telecourse Guide for Psychology: The Study of Human Behavior by Werthman; television programs from the series *Psychology: the Study of Human Behavior*; take home quizzes to encourage reading and processing the text; a 500 word essay (Study Activity); and matching/multiple choice examinations .

The Telecourse students had limited contact with the instructor and the other students in the class compared to the On-Campus Psychology 1 students. Telecourse students met with the instructor for a two hour orientation session, four two-hour review sessions; and two four-hour examination sessions (10 hours) by mid-term. Telecourse students were also encouraged to call, or visit the instructor during office hours if they needed assistance. The On-Campus students had all the same assignments, viewed the same television programs, took the same examinations, but had a total of 27 hours of contact by mid-term.

Instruments

The LSI is a twelve item questionnaire on which the respondent rates statements about how they learn from "most like you" to "least like you". These response totals are organized into four *learning modes*: Concrete Experience (CE) emphasizes personal involvement with people in everyday situations. The individual relies more on feelings than on a systematic approach to problems and situations, learning from feeling. Reflective Observation (RO) refers to understanding ideas and situations from different points of view, learning by watching and listening. Abstract Conceptualization (AC) involves using logic and ideas, rather than feelings, to understand problems or situations, learning by thinking. Active Experimentation (AE) involves a practical approach to influencing or changing situations, learning by doing.

Each persons learning style is a combination of the four basic learning modes:

- Converger combines Abstract Conceptualization and Active Experimentation - people with this learning style are best at finding practical uses for ideas and theories, would rather deal with technical tasks and problems than with social and interpersonal issues.
- Diverger combines Concrete Experience and Reflective Observation - people with this learning style are best at viewing concrete situations from many different points of view, observe rather than take action.
- Assimilator combines Abstract Conceptualization and Reflective Observation - people with this learning style are best at understanding a wide range of information and putting it into concise, logical form; less focused on people and more interested in abstract ideas and concepts.
- Accommodator combines Concrete Experience and Active Experimentation - people with this learning style have the ability to learn primarily from "hands-on" experience, act on "gut feelings rather than on logical analysis, rely more heavily on people for information than on technical analysis.

FINDINGS

Factual Information

The following tables present descriptive demographic data obtained at all orientation sessions for Psychology 1 using the Student Data Sheet.

	Started	Dropped	At Mid-Term
Female	35 (67%)	22 (73%)	13 (59%)
Male	17 (33%)	8 (27%)	9 (41%)
Combined	52	30	22

Table 1 Telecourse Students Distribution by Sex

	Started	Dropped	At Mid-Term
Female	43 (64%)	18 (72%)	25 (60%)
Male	24 (36%)	7 (28%)	17 (40%)
Combined	67	25	42

Table 2 On-Campus Students Distribution by Sex

Tables 1 and 2 reflect the Los Rios Community College District estimates that two-thirds of the student population are female. For the Psychology 1 course this holds true for initial enrollments, but females also dropped in greater numbers than males. For those students enrolled in Psychology 1 at mid-term there is a 60/40 split for females/males.

Tables 1 and 2 also reveal that the overall drop rate for Telecourse students was 58%, while the drop rate for On-Campus students was 37%.

Examination of Tables 3 and 4 reveal that Telecourse students who started the course were, on the average, four years older than On-Campus students who started the course. It seems that there is a slight tendency for the older Telecourse students to drop, while the younger On-Campus students tend to drop.

	Started	Dropped	At Mid-Term
Female	25.5	26.0	24.5
Male	27.1	27.8	26.4
Combined	26.3	26.9	25.5

Table 3 Telecourse Students Distribution by Average Age

	Started	Dropped	At Mid-Term
Female	23.8	23.2	24.3
Male	21.0	20.4	21.6
Combined	22.4	21.8	22.9

Table 4 On-Campus Students Distribution by Average Age

Tables 5 and 6 reveal an interesting trend. Students who started the telecourse had completed twice as many previous college units as students who started the on-campus courses. With the exception of the On-Campus female students, students dropping both telecourse and on-campus sections had completed fewer units than those who were still enrolled at mid-term.

	Started	Dropped	At Mid-Term
Female	28.6	16.5	40.7
Male	37.7	34.3	41.0
Combined	33.1	25.4	40.9

Table 5 Telecourse Students Average Previous Units

	Started	Dropped	At Mid-Term
Female	19.2	19.9	18.4
Male	10.3	6.6	13.9
Combined	14.7	13.3	16.3

Table 6 On-Campus Students Average Previous Units

The following hypothesis test is based on Tables 5 and 6 and the following defined populations:

Population 1: Telecourse students enrolled at mid-term
Population 2: On-Campus students enrolled at mid-term

μ_1 = the mean of the units completed by Population 1 students
μ_2 = the mean of the units completed by Population 2 students

H_o: $\mu_1 - \mu_2 = 0$ There is no difference in the means.
H_a: $\mu_1 - \mu_2 > 0$ $\mu_1 > \mu_2$

Use $\alpha = 0.05$ A 5% level of significance.

The test statistic is

$$Z = \frac{\overline{X} - \overline{Y}}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

If $Z > z_c$ (=1.65), then reject H_o

From Tables 5 and 6, $\overline{x} = 40.9$, $s_1 = 43.48$, $n_1 = 22$, $\overline{y} = 16.3$, $s_2 = 22.77$, and $n_2 = 42$

$$z = \frac{40.9 - 16.3}{\sqrt{\frac{43.48^2}{22} + \frac{22.77^2}{42}}} \text{ , and } \quad z = 2.46$$

Because 2.46 > 1.65, reject H_o and accept H_a. The mean number of units previously completed by Telecourse students is significantly larger than the mean number of units previously completed for On-Campus students.

Tables 7 and 8 present the data for those students who enrolled in Psychology 1 with zero previous college units, and whether they were enrolled or had dropped at mid-term. Half of the On-Campus students with zero units dropped, while 71% of the Telecourse students dropped by mid-term.

	Started	Dropped	At Mid-Term
Female	11	9	2
Male	3	1	2
Combined	14	10 (71%)	4 (22%)

Table 7 Telecourse Students With Zero Previous Units

	Started	Dropped	At Mid-Term
Female	15	8	7
Male	11	5	6
Combined	26	13 (50%)	13 (50%)

Table 8 On-Campus Students With Zero Previous Units

The following hypothesis test was based on the data presented in Tables 7 and 8 and the following defined proportions:

Population 1: Telecourse students with zero previous units
Population 2: On-Campus students with zero previous units.

P_1 = the proportion of those students who dropped by mid-term
P_2 = the proportion of those students who dropped by mid-term
H_0: $P_1 - P_2 = 0$ There is no difference in the proportions.
H_a: $P_1 - P_2 > 0$ $P_1 > P_2$

Use $\alpha = 0.05$ A 5% level of significance

The test statistic will be

$$Z = \frac{\hat{P}_1 - \hat{P}_2}{\sqrt{P^*(1-P^*)}\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

P^* is the pooled proportion

If $Z > z_c$ (=1.65), then reject H_0

From Tables 7 and 8 $\hat{p}_1 = 0.714$, $\hat{p}_2 = 0.500$, $p^* = 0.575$

$$z = \frac{0.714 - 0.500}{\sqrt{(0.575)\,(0.425)}\ \sqrt{\frac{1}{28} + \frac{1}{52}}} = 1.31$$

Because 1.31 is < 1.65, do not reject the H_o. At $\alpha = 0.10$ the critical z_c is 1.28. Since $1.31 > 1.28$ reject H_o and accept H_a.

Table 9 presents the learning styles and mid-term grades for all students enrolled in Psychology 1.

Grade	Accommodator	Assimilator	Converger	Diverger	Totals
A or B	3	15	2	11	31
C	2	9	4	10	25
D or F	2	3	1	3	8
Totals	7	27	7	23	64

Table 9 Learning Styles and Mid-term Grades for All Psychology 1 Students

A Chi Square test of independence was used on the data in Table 9.

H_o: Mid-term grades are independent of learning styles.
H_a: Not H_o

Use $\alpha = 0.05$ A 5% level of significance

The test statistic will be:

$$\chi^2 = \Sigma \frac{O_{ij}^2}{E_{ij}} - n$$

If $\chi^2 > \chi^2_c$ (= 12.59), then reject H_o.

Using the data in Table 9, $\chi^2 = 7.18$.

Because $7.18 < 12.59$, do not reject H_o.

Table 10 presents a comparison of learning styles for All Students who were enrolled in Psychology 1 at mid-term, and for those who had dropped.

Status	Accommodator	Assimilator	Converger	Diverger	Totals
Enrolled	3	12	2	5	22
Drop	4	15	5	18	42
Totals	7	27	7	23	64

Table 10 Learning Styles for All Students at Mid Term

A Chi Square test of independence was used on the data in Table 10.

H_o: Dropping by mid-term is independent of the learning styles of students who dropped.

H_a: Not H_o

Use $\alpha = 0.05$ A 5% level of significance

The test statistic will be:

$$\chi^2 = \Sigma \frac{O_{ij}^2}{E_{ij}} - n$$

If $\chi^2 > \chi^2_c$ (=7.81), then reject H_o.

Using the data in Table 10, $\chi^2 = 3.17$.

Because $3.17 < 7.81$, do not reject H_o.

Table 11 presents the learning styles for Telecourse Students who were enrolled in Psychology 1 at mid-term, and for those who had dropped.

Status	Accommodator	Assimilator	Converger	Diverger	Totals
Enrolled	3	12	2	5	22
Drop	4	9	5	12	30
Totals	7	21	7	17	52

Table 11 Learning Styles for Telecourse Students at Mid Term

A Chi Square test of independence was used on the data in Table 11.

H_o: Dropping by mid-term is independent of the learning styles of students who dropped.

H_a: Not H_o

Use $\alpha = 0.05$ A 5% level of significance

The test statistic will be:

$$\chi^2 = \Sigma \frac{O_{ij}^2}{E_{ij}} - n$$

If $\chi^2 > \chi^2_c$ (= 7.81), then reject H_o.

Using the data in Table 11, $\chi^2 = 3.59$.

Because $3.59 < 7.81$, do not reject H_o.

Finally, Table 12 presents a comparison of learning styles for On-Campus Students who were enrolled in Psychology 1 at mid-term, and for those who had dropped.

	Accommodator	Assimilator	Converger	Diverger	Totals
Enrolled	4	15	5	18	42
Drop	7	4	1	13	25
Totals	11	19	6	31	67

Table 12 Learning Styles for On-Campus Students at Mid-Term

A Chi Square test of independence was used on the data in Table 11.

H_0: Dropping by mid-term is independent of the learning styles of students who dropped.

H_a: Not H_0

Use $\alpha = 0.05$ A 5% level of significance

The test statistic will be:

$$\chi^2 = \Sigma \frac{O_{ij}^2}{E_{ij}} - n$$

If $\chi^2 > \chi^2_c$ (=7.81), then reject H_0.

Using the data in Table 12, $\chi^2 = 6.78$.

Because $6.78 < 7.81$, do not reject H_0. If $\alpha = 0.10$ is used, then we reject H_0 and accept H_a since $6.78 > 6.25$.

Interpretation

The data presented in Tables 5 and 6 support the observation that Psychology 1 Telecourse students enrolled at mid-term have completed more previous college units than those On-Campus students enrolled at mid-term in Psychology 1. This result was significant at the .05 level, and suggests that more previous college experience may have developed skills and attitudes that support the independent work required in a telecourse. This also may explain why the Telecourse students enrolled at mid-term were almost 3 years older than On-Campus students.

A previous study conducted by this investigator (1990) showed that for all students that began the Psychology 1 Telecourse in Fall 1990 the average number of prior units completed was 26.5, for those who dropped the course 16.2 units, and for those who completed the class 36.8 units. Even though a statistical analysis was not conducted on these data, it seems obvious that the Telecourse students who dropped had completed half the units of those who finished the course. Again this suggests that accumulated college experience is associated with the completion of a telecourse.

The data for students with zero previous college units, presented in Tables 7 and 8, show an interesting trend that failed to reach significance at the 5% level. It appeared that 71% of the Telecourse students with zero units dropped by mid-term, while 50% of the On-Campus students with zero units dropped. Even though the null hypothesis was accepted at the 5% level of significance, H_0 can be rejected at the 10% level of significance. This means that 10 times out of 100 this rejection could be in error. This researcher speculates that students with zero previous units would insure their chances to stay enrolled at mid-term if they enrolled in an on-campus section of Psychology 1, rather than a telecourse section. The implication is that regular contact with the instructor and the other students helps an inexperienced student develop the skills, knowledge, and attitudes necessary to stay enrolled at mid-term.

This research project was interested in assessing the effect of learning style on selection and retention of the Telecourse and On-Campus presentation of Psychology 1, and with mid-term grades. The first analysis was a Chi Square test of independence for learning styles and mid-term grades for both Telecourse and On-Campus students enrolled in Psychology 1. This test failed to reach significance at the 5% level. Consequently, it can be stated that mid-term grades are independent of learning styles for students enrolled in Psychology 1 whether it is presented in the traditional classroom format or by telecourse.

The next research question asked if there was any connection between learning style and whether a student dropped or stayed enrolled at mid-term. Table 10 presented the data for both Telecourse and On-Campus students enrolled at mid-term, and for those who had dropped. A Chi Square test of independence failed to obtain significance at the 5% level. Consequently the null hypothesis was not rejected: Dropping by mid-term was independent of the learning styles for both Telecourse and On-Campus students who dropped.

Table 11 presented the data for only Telecourse students enrolled at mid-term, and for those who had dropped. Again a Chi Square of independence failed to obtain significance at the .05 level. Consequently the null hypothesis was not rejected: Dropping by mid-term was independent of the learning styles of Telecourse students who dropped.

Table 12 presented the data for only On-Campus students enrolled at mid-term, and for those who had dropped. Again a Chi Square of independence failed to obtain significance at the .05 level. Consequently the null hypothesis was not rejected: Dropping by mid-term was independent of the learning styles of On-Campus students who dropped. Since the obtained Chi Square value of 6.78 was very close to the 7.81 required for rejection at the 5% level of significance, this researcher is willing to accept the results as significant at the 10% level. Now the null hypothesis that dropping by mid-term is independent of the learning styles of On-Campus students is rejected. The alternative hypothesis that dropping by mid-term is dependent on the learning styles of On-Campus students who dropped is accepted.

Learning Style	Components	Drop Rate	Retention Rate	Proportion of Mid-Term Class
Accommodator	Concrete Experience & Active Experimentation	64%	36%	9.5%
Diverger	Concrete Experience & Reflective Observation	42%	58%	42.8%
Assimilator	Abstract Conceptualization & Reflective Observation	21%	79%	35.7%
Converger	Abstract Conceptualization & Active Experimentation	20%	80%	11.9%

Table 13 Learning Styles & Components for On-Campus Students at Mid-Term

Table 13 is based on the data presented in Table 12, and presents the proportion of On-Campus students that dropped/stayed enrolled in Psychology 1 and their respective learning styles. Table 13 also shows the combination of learning modes that make up each learning style. The highest drop rate was for Accommodators and Divergers, and lowest for Assimilators and Convergers. Stated positively, 79% of the Assimilators and 80% of the Convergers stayed in the class and were enrolled at mid-term. Divergers and Assimilators composed the majority of learning styles in the On-Campus students enrolled at mid-term.

In looking at this distribution of learning styles (significant at the 10 % level) there is a common learning mode, Abstract Conceptualization, that both Divergers and Assimilators share. The nature of Psychology 1 covers a wide range of information about behavior and puts it into concise logical form - abstract ideas and concepts - theories, methods, models. The Accommodators dropped in largest numbers. It is speculated that they need more action-oriented classes where they can learn from "hands-on" experience. It would be interesting to sample the learning styles of students enrolled in laboratory or performance type courses to see if more Accommodators selected this type of course work. The traditional academic college preparatory courses emphasize subject matter, and teaching methods that favor abstract conceptualization rather than concrete experience and active experimentation.

This instructor/researcher has an Assimilator learning style. It is interesting to note that of those students remaining at mid-term 36% were also Assimilators. Forty three percent of the students enrolled at mid-term were Divergers. Divergers share the Reflective Observation learning mode in common with the Assimilator style. These results give strong evidence that students with learning styles compatible with the instructor's learning style form a bond that keeps those students in classes. What differentiates those Divergers who stayed from those that dropped? Further research on this relationship is warranted.

SUMMARY

Higher drop rates for Psychology 1 Telecourse students than On-Campus students prompted this classroom based research project. It was hypothesized that learning style, as measured by the Learning Style Inventory (Kolb, 1981), might be a relevant factor associated with selection and retention by mid-term.

The learning styles of 52 Telecourse and 67 On-Campus students enrolled in Psychology 1 were obtained using the LSI. Demographic and learning styles were then analyzed for those students who dropped the course and who were still enrolled at mid-term. The relationship between learning style and mid-term grades was also examined.

It was found that the Telecourse students enrolled at mid-term had completed 2.5 times as many units as On-Campus students enrolled at mid-term. This result was significant at the 5% level.

It was found that Telecourse students with zero previous units were more likely to drop Psychology 1 by mid-term than On-Campus students with zero previous units. This was significant at the 10% level.

Mid-term grades were independent of learning style for all Psychology 1 students whether they were enrolled in the telecourse or in an on-campus section.

Learning style was independent of whether a student dropped Psychology by mid-term for all students enrolled in Psychology 1. For On-Campus students only, however, learning style was dependent on whether a student dropped the course or not. This was significant at the 10% level.

Accommodators (64%) and Divergers (42%) showed the largest drop rate. It was speculated that this was because both learning styles prefer the Concrete Experience learning mode and that Psychology 1 tends to emphasize abstract conceptualization. When considering the proportion of students with varying learning styles who were still enrolled at midterm Divergers were in the majority with 42.8% and next were Assimilators with 35.7%. It seems that this 78.7% of the class at mid-term either match the instructor's learning style (Assimilator) or share at least one of the learning modes that make up the Assimilator style (Reflective Observation). Further research is needed to discover how the learning style of instructors and students interact.

RESEARCH FACULTY COMMENTS

My 25 year community college teaching career has included many experiences with innovating new courses and experimenting with new teaching technologies. I am excited about the potential of telecourses and the interactive electronic classroom (Dowdall, Spring 1990) to serve the needs of the *New Majority* student.

In the March 1991 Bulletin of the Faculty Association of California Community Colleges, Chancellor David Mertes says: "We admit the student into the college, but often times the student's first choices for classes are already full - so the student is forced to take other classes, take a reduced load, or simply walk away"..."marrying teaching to technology could solve our growth problems" (Mertes, 1991).

I believe strongly in the concept of classroom based research, because it benefits the students directly. I wish to express my appreciation to Kirk Wiecking for suggesting that I conduct research on one of my innovation projects, he has been a moving force keeping this program together. Gene Sellers has been an invaluable resource and support member of the team with his expertise on research methodology and statistical analysis. I would also like to express my appreciation to the other faculty members involved in classroom based research for sharing ideas and support. Our group meetings were invaluable.

REFERENCES

Brey, Ronald and Charles Grigsby. "Telecourse Student Survey 1984." Austin, TX: The Research Group, 1984.

Crane, Valerie, "A Study of Formative Research Practices for the Annenberg/CPB Projects: The First Five Years." Chestnut Hill, MA: Research Communications, Ltd., 1985.

Crane, Valerie. "Academic Evaluation of the Annenberg CPB/Telecourses." Chestnut Hill, MA: Research Communications, Ltd., 1988.

Dowdall, Richard J. Developing Instructor Competence in the Electronic Classroom: Adapting General Principles of Psychology to the Electronic Classroom. Sacramento City College: A Report to the Professional Standards Committee, 40% Type B Professional Development Leave, Spring 1990.

Dowdall, Richard J. Presenting Psychology 1 To Distant Learners. Sacramento City College: Classroom Based Research Project, Fall 1990.

Dowdall, Richard J. Distance Learning. Sacramento City College: Video produced for a Staff Development presentation, Spring 1991.

Ehrmann, Stephen C. "Reaching Students, reaching Resources: Using Technologies to Open the College." Academic Computing, April 1990, pp. 10-14, 32-34.

Kolb, David A. Learning Style Inventory. Boston: McBer & Company, 1981.

Mertes, David. "The Mind of Mertes". Faculty Association of California Community Colleges Bulletin, March 1991, p. 1 & 9.

INVESTIGATING SOME STRATEGIES TO LOWER ATTRITION IN BIOLOGY

A RESEARCH PROJECT CONDUCTED BY
ALYCE FIEDLER AND GEORGE BLEEKMAN
DEPARTMENT OF BIOLOGY
AMERICAN RIVER COLLEGE
FALL SEMESTER 1991

OVERVIEW

Introduction

Demographics in the Community College have changed dramatically over the last fifteen years. Today's students attend school on a "part-time" basis, work up to 40 hours a week, live away from home, and are financially responsible for themselves. The amount of time they have to devote to school work is limited, therefore, they select classes they can manage within their work schedule. Furthermore, if time constraints and/or work load become too intense, they will tend to drop the more demanding classes.

Problem

Taking Biology 16, or perhaps any class in science, for many students is anxiety-promoting. Because of some previous science class or preconceived idea, their attitude is one of fear and apprehension. We've developed a variety of materials to make the task more reasonable; written objectives for both reading and lecture so students know what they are responsible for, self-tests, flash cards, individual learning activities, etc. However, it still takes time and effort to master the subject, so , in deference to our efforts, the attrition rate in Biology 16 continues to increase.

Purpose

The purpose of this project is to identify some classroom strategies that will encourage attendance, reduce student anxiety and lower our attrition rate. In addition, we would like to accomplish this without loss of learning potential. In other words, we want the students to do as well or better academically than what they have done in the past.

Investigation

The major problems being addressed in this study are:

1. Do weekly quizzes in both lecture and laboratory create an excessive workload for the students?
2. Will the elimination of weekly quizzes in lecture reduce learning, thereby, leading to lower scores on the unit exams?
3. Does poor attendance in the laboratory correlate with student withdrawals?

Assumptions

Based upon the problems listed above the assumptions of this study are:

1. By reducing or eliminating lecture quizzes our students will perceive a reduced workload. A reduced workload may reduce the stress of constant quizzing which may result in a higher retention rate for the class.
2. No significant difference will result in academic performance on unit exams without quizzes.
3. By awarding modest number of grade points for completing work in the laboratory, students will be able to establish a more responsible regimen for laboratory attendance, hence allowing an increased opportunity to perform well on laboratory quizzes and unit exams. This may increase retention.

Explanation

The issue at hand is retention of students in the general biology 16 class. If students perceive the class as overwhelming because of the volume of material presented, this perception may be reinforced by a constant regimen of weekly quizzes. It is assumed that by eliminating this regimen, the result will be an improved retention rate.

Second, it is assumed that by elimination of weekly quizzes no significant difference will occur in the academic performance of our students. Those who adequately prepare will continue to do so, and those who don't, won't.

Third, we have found that students who miss class frequently, get behind in their work and become discouraged, are far more likely to drop the class. If attendance and completion of the laboratory work is rewarded in a manner that has a positive effect on their grade, they may be encouraged to attend on a more constant basis. This would provide an opportunity to understand the material better, work with fellow students in a small group situation and have access to the instructor on a one-to-one basis. This hopefully would lead to lower attrition.

Scope

The parameters of this study include a comparison of the percent correct response for identical questions on predetermined unit exams for a period of two or more semesters. The study includes:

1. Biology 16 students population for spring semesters of 1990/1991 and fall 1990 (control).
2. Biology 16 student population for fall semester 1991. (experimental group)
3. Three single units of study in both student populations.

   Unit 1 - Cell Unit
   Unit 2 - Physiology Unit - Part A
   Unit 3 - Physiology Unit - Part B

Identical questions on the unit exams for each of the above will be compared between past and present semesters.

In addition, a pretest was administered to the fall semester 1991 group using questions which would later be included in the unit exam for that group.

Census figures for past semesters' retention rates are being compared to the 1991 figures. The current study is to be conducted over two consecutive semesters, fall 1991 and spring 1992.

METHODOLOGY

Design

This study is designed using a class population of approximately 250 students.

1. In the fall 1991 no lecture quizzes were given in units 1, 4A and 4B.
2. In the spring of 1990/1991 and fall 1990 quizzes were administered to the lecture class during the study of units 1, 4A, and 4B.
3. In the spring of 1990/1991 and fall 1990 grade points were not awarded to the students in the laboratory.
4. In the fall of 1991 grade points were awarded to the students in the laboratory.

Populations

The 1991 fall and 1992 spring populations of Biology 16 students are serving as the experimental group.

The populations of Biology 16 students for three prior semesters will serve as the control groups.

Instruments

1. Predetermined questions on multiple choice exams were used for comparison.
2. Item analyses were used to determine the correct percent of response for each of the predetermined questions used in the comparative study.
3. Statistical analyses of the data were prepared.
4. Enrollment records of two prior semesters were used for comparison.

Procedure

In the topical areas selected, lecture information was presented with no significant difference between fall 1991 and previous semesters. At the end of each unit, the unit exam was analyzed.

Collection

Data collection involved grading the predetermined questions and comparing them with the same questions on former tests.

Processing

The statistical analysis compares results on exams without prior lecture quizzes to the same questions on exams with quizzes. An additional analysis compares census information for fall 1991, with that of two previous semesters.

Limitations

The study involves two major variable factors - no lecture quizzes and the awarding of grade points for attendance and laboratory completion. If the retention rate does improve, we still will not know which of the two factors had a stronger influence.

Many more subtle variables exist. Due to withdrawals, the student profile will change as the semester progresses, therefore, the same population of students does not exist throughout. From one semester to the next, the student population may vary in ability, experience, age, etc. Therefore, having two groups (experimental and control) identical in every aspect except the one being tested is virtually impossible.

Finally, because the sample size for comparison at the drop rate data was small, the results may be skewed.

FINDINGS

Analysis of the Data

1. The following were used for the calculations of the Unit exam data:

Population #1 -	Fall 1991 students who were not given weekly quizzes preceding the Unit exams (Experimental group)
Population #2 -	Students from three previous semesters who had been quizzed weekly prior to Unit exams (Control group)

The hypotheses used for each of the three exams included in this study were:

$H_o: \mu_1 - \mu_2 = 0$ There is no difference in the mean scores for Populations #1 and #2.

$H_a: \mu_1 - \mu_2 < 0$ The mean score for Population #1 is less than the mean for Population #2.

The test statistic used for all Unit exams was:

$$Z = \frac{\overline{X} - \overline{Y}}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

$\overline{X}$ = mean of the data from Population #1.

$\overline{Y}$ = mean of the data from Population #2.

S_1 = Standard deviation of data for Population #1.

S_2 = Standard deviation of data for Population #2.

n_1 = Number of questions given to Population #1.

n_2 = Number of questions given to Population #2 (total for three semesters).

For each of the Unit exams, a 5% level of significance was used, therefore:

If $Z<z_c$ (= -1.65), then reject H_o

If Z>zc (= -1.65), then do not reject H_o.

EXAM #1

Data: Comparing the percent correct response of Populations #1 and #2 on twenty-five identical exam questions. (NOTE: The Pretest data was for our own information and was not utilized in the following analyses.)

	POPULATION #1		POPULATION #2		
	FALL '91 UNIT #1 PRETEST % correct	FALL '91 POST TEST w/o quizzes % correct	SPRING '91 w/quizzes000 % correct	FALL '90 w/quizzes % correct	SPRING '90 w/quizzes % correct
1)	59	89	95	93	95
2)	28	73	75	76	80
3)	16	64	69	77	71
4)	46	81	75	74	73
5)	26	80	75	74	71
6)	37	83	74	59	61
7)	40	86	85	89	87
8)	34	69	75	79	82
9)	61	85	90	88	87
10)	23	62	67	67	66
11)	16	64	66	61	66
12)	56	81	81	84	82
13)	30	75	76	74	75
14)	30	62	70	68	74
15)	32	61	70	73	75
16)	34	73	78	81	78
17)	43	77	74	76	77
18)	60	77	76	74	78
19)	11	59	65	63	57
20)	12	57	58	62	59
21)	14	65	69	69	62
22)	34	95	83	79	82
23)	23	62	69	70	72
24)	22	71	69	70	73
25)	20	66	77	74	71

Analysis of the Exam #1 data:

$$z = \frac{72.68 - 74.25}{\sqrt{\frac{10.44^2}{25} + \frac{8.54^2}{75}}}$$

$\bar{x} = 72.68$ $\bar{y} = 74.25$
$s_1 = 10.44$ $s_2 = 8.54$
$n_1 = 25$ $n_2 = 75$

$$z = \frac{-1.57}{2.30} = -0.68$$

Since -0.68 is greater than -1.65, do not reject the H_o.

EXAM #4 = Part A

Data: Comparing the percent correct response of Populations #1 and #2 on twenty-two identical exam questions.

	POPULATION #1	POPULATION #2		
	FALL '91 w/o quizzes; % correct; Unit exam	SPRING '91 w/quizzes; % correct; Unit exam	FALL '90 w/quizzes; % correct; Unit exam	FALL '89 w/quizzes; % correct; Unit exam
1)	79	87	87	86
2)	81	84	83	86
3)	68	68	76	61
4)	81	86	86	82
5)	62	66	65	74
6)	72	71	78	65
7)	96	93	95	95
8)	77	84	83	83
9)	69	68	73	66
10)	72	71	73	72
11)	71	83	77	75
12)	76	73	77	69
13)	65	75	63	72
14)	77	80	83	84
15)	83	83	89	89
16)	85	87	87	84
17)	89	87	87	82
18)	73	72	--	73
19)	71	73	75	79
20)	68	68	66	73
21)	78	70	84	78
22)	71	68	77	74

Analysis of the Exam #4 - Part A data:

$$z = \frac{75.64 - 77.89}{\sqrt{\frac{8.08^2}{22} + \frac{8.30^2}{65}}}$$

$\bar{x} = 75.64$ $\bar{y} = 77.89$

$s_1 = 8.08$ $s_2 = 8.30$

$n_1 = 22$ $n_2 = 65$

$$z = \frac{-2.25}{2.00} = -1.12$$

Since -1.12 is greater than -1.65, do not reject H_o.

EXAM #4 - PART B

Data: Comparing the percent correct response of Populations #1 and #2 on eleven identical exam questions.

	POPULATION #1	POPULATION #2		
	FALL '91 w/o quizzes % correct; Unit exam	SPRING '91 w/quizzes % correct; Unit exam	FALL '90 w/quizzes % correct; Unit exam	FALL '89 w/quizzes % correct; Unit exam
1)	82	79	84	78
2)	85	80	91	83
3)	89	93	93	94
4)	82	75	72	74
5)	74	80	74	60
6)	90	89	91	85
7)	79	81	83	77
8)	--	78	68	68
9)	75	66	69	69
10)	77	78	78	87
11)	90	93	95	--
12)	56	67	43	--

Analysis of the Exam #4 - Part B data:

$$z = \frac{79.91 - 78.68}{\sqrt{\frac{9.80^2}{11} + \frac{11.22^2}{34}}}$$

$\overline{x} = 79.91$ $\overline{y} = 78.68$
$s_1 = 9.80$ $s_2 = 11.22$
$n_1 = 11$ $n_2 = 34$

$$z = \frac{1.23}{3.52} = 0.35$$

Since 0.35 is greater than -1.65, do not reject H_o.

2. The following were used for the calculations of the census information.

Population #1 - Fourth and eleventh week census figures for students during the Fall semester, 1991. These students were not quizzed weekly in lecture and were given points for completion of laboratory work. (Experimental Group)

Population #2 - Fourth and eleventh week census figures for students during the Spring 1991, and Fall 1990. These students were quizzed weekly in lecture and did not receive points for laboratory completion. (Control Group)

The hypotheses used for Population #1 and #2 census information included in this study were:

H_o: $\mu_1 - \mu_2 = 0$ There is no difference in the mean scores for Populations #1 and #2.

Ha: $\mu_1 - \mu_2 < 0$ The mean score for Population #1 is less than the mean for Population #2.

The test statistic used for all census figures was:

$$Z = \frac{\overline{X} - \overline{Y}}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

$\overline{X}$ = mean of the data for Population #1
$\overline{Y}$ = mean of the data for Population #2.
S_1 = standard deviation of data for Pop. #1.

S_2 = standard deviation of data for Pop. #2
n_1 = number of sections in the Population #1 census.
n_2 = number of sections in the Population #2 census.

For each set of census figures, a 5% level of significance was used, therefore :

If $Z < z_c$ (= -1.65), then reject H_o.
If $Z > z_c$ (= -1.65), then do not reject H_o.

Data: Comparing the difference in drop-rates for Population #1 and #2.

POPULATION #1		POPULATION #2			
Fall 1991		Spring 1991		Fall 1990	
4th	11th	4th	11th	4th	11th
107	97	107	100	90	93
103	100	87	80	97	73
93	80	103	100	83	77
90	87	90	83	57	53
97	93	103	103	80	67
97	93	87	83	77	70
90	93	87	83	60	70
77	73	80	73	57	50
100	100	80	73	67	63
94.8	90.6	97	87	67	63
		87	87	63	47
		60	57	73	63
		89.25	76.75	72.25	63.58

Analysis of the Census Information data:

$$z = \frac{4.2 - 7.5}{\sqrt{\frac{4.79^2}{9} + \frac{5.66^2}{24}}}$$

$\bar{x} = 4.2$ $\quad \bar{y} = 7.5$

$s_1 = 4.79$ $\quad s_2 = 5.66$

$n_1 = 9$ $\quad n_2 = 24$

$z = -1.67$

Since -1.67 is less than -1.65, rejection of H_o is indicated.

Interpretation

Since the "z" values for all three exams were greater than -1.65, the findings suggest that the H_o should not be rejected. There is not sufficient evidence to claim that the mean test score of Population #1 (without lecture quizzes) is less than the mean test score of Population #2 (with lecture quizzes). This indicates that performance on unit exams is no better with weekly quizzes than without.

On the other hand, the "z" value for the census information was slightly less than -1.65, perhaps because of small sample size. However, it does tend to reject H_o and support H_a. This implies that the drop rate was lower for Population #1 (no weekly lecture quizzes and given points for laboratory completion) than for Population #2 (with weekly lecture quizzes and no points for laboratory completion).

Summary

In an attempt to encourage attendance, reduce student anxiety and lower the attrition rate in our Biology 16 class, we tried two different strategies with our students this semester. We eliminated weekly quizzes in lecture and established a way of gaining points for attendance and completion of laboratory work. Since these techniques were new in our course, we used the Fall 1991 class as our experimental group (Population #1) and students from the three previous semesters as our control (Population #2). Performance on identical questions from three different unit exams were compared in both populations to see if test scores dropped without weekly lecture quizzes this semester. This did not seem to occur. We also compared the drop rate of this semester's students with those of two previous semesters. The drop rate for fall 1991 appears to be lower.

Conclusions

1) Based on the analyses of the exam data, there appears to be no significant difference between student performance on exams with or without weekly lecture quizzes.

2) The analysis of the census data indicates the retention rate was greater for the experimental group. This would tend to support the concept that no weekly lecture quizzes and points awarded for laboratory completion can lower the attrition rate.

Recommendations

1) Extend the study into spring semester 1992 in order to provide a broader base of sample data.

2) Develop and implement a student survey which would provide some data regarding their perception of the value of lecture quizzes. Quizzes could be given in selected units not presently included in this study so that a comparison could be made.

3) Because there appears to be no significant difference between quizzes or no quizzes preceding each exam, it should be the individual instructor's prerogative as to which procedure is followed. There could be some benefits to the student from quizzing that have not been identified in this study.

COOPERATIVE LEARNING IN A DEVELOPMENTAL READING COURSE

A RESEARCH PROJECT CONDUCTED BY
WILLIAM MORRIS
ENGLISH DIVISION
AMERICAN RIVER COLLEGE
FALL SEMESTER, 1991

OVERVIEW

Introduction

In our complex and competitive world, both cooperation skills and reading skills are becoming ever more important. This study explores the effectiveness of the use of one instructional approach, cooperative learning, in improving student use of one important reading skill, identification of main ideas in paragraphs.

Cooperative learning is an instructional technique which requires students to work together in small groups on a structured learning task. It has been shown, mostly in pre-collegiate studies, to promote quite a range of outcomes which may be considered helpful, perhaps critical, for college student success. (Cooper, 1991) In contrast to sole reliance on the lecture method (focusing on private, individual, and/or competitive procedures), cooperative learning is purported in the literature to support:

- Higher-level Thinking Skills
- Retention (course and college)
- Skill in Oral Communication
- Social Skills
- Positive Race Relations
- Learning and Academic Achievement
- Positive Attitude toward Learning and Subject Matter
- Student Self-Esteem
- Active Student Involvement in Learning

Background

As were many college instructors, I was taught largely through the lecture method, and though familiar with the alleged benefits and general procedures of cooperative learning, had not personally, committed myself to a careful process of refining groupwork techniques. I was impressed with the rationale for cooperative learning, and though I had not done research during the 20 years since my graduate degree, I decided to use this study as an opportunity to begin learning groupwork procedures in an action research setting.

In addition to probing the effectiveness of cooperative learning as applied in my own classes, I also hoped the project would occasion three ancillary benefits: 1) my own learning of cooperative learning technique, 2) personal involvement in instructional research, 3) and collaboration with colleagues.

Problem

Students in my two Basic Reading Skills classes are varied in age, interest, and motivational level. They are a mix of re-entry students and recent high-school graduates, both adjusting to the rigors of college academics. Many are learning English as their second language. Many have difficulty focusing and maintaining attention. Many are not used to listening carefully, seem hesitant to become involved in their own learning process, and lack well developed groupwork skills.

Purpose

The purpose of this study was to determine whether the combined use of certain cooperative learning activities with lecture during four weeks of instruction in one section of a course would result in more learning than the use of the lecture method without such cooperative activities in a similar section of the same course. A related purpose was to monitor student reactions to groupwork in the experimental section.

Assumption

The rationale for this study is based on the assumption that student learning is limited by a composite of problematical variables (see "Problem" above) which can be reduced by student participation in cooperative learning activities.

Student discussion indicated that many students had not been expected by parents or teachers to develop interpersonal skills in task-focused assignments. They felt embarrassed to speak up in the large class situation and had learned to keep their thoughts to themselves. The provision of supportive small groups of peers was hoped to encourage students to risk involvement and, through increased participation, improve learning as measured on a test.

Hypothesis

With regard to student skill improvement, it was anticipated that the experimental class, experiencing cooperative learning activities as well as lecture, would out-perform the control class, which would not experience cooperative learning.

The null hypothesis was that there would be no difference in the posttest score means of the two classes. It was also hypothesized that the experimental class would achieve a greater average pre-post test gain than the control class.

With regard to student reaction to the experimental treatment, it was anticipated that most students would comment favorably on the inclusion of groupwork.

Scope

The study was limited to two sections of the same course and to instruction over a four week period on a single unit of study.

Literature

While over 600 studies on cooperative learning of precollegiate students had been reported in the ERIC system by 1989, only a few had been published concerning the college population. Cooper (1990-b) notes that, "Although the research on Cooperative Learning indicates that it is a powerful procedure for influencing student achievement and attitudes, the technique has not been implemented systematically in many college classrooms," and suggests there is a pressing need for experimentation at the college level.

Leaders such as Johnson (1984), Kagan (1989), and Slavin (1983) have articulated both rationale and methodology for instituting cooperative learning. Cooper (1989), Slavin (1991), and Newmann (1987) have surveyed the literature and offer helpful research summaries and annotated bibliographies.

Based upon usage in the literature, cooperative learning is here defined as a structured instructional strategy in which small groups work together toward a common goal. Following Jim Cooper's work with college students at CSU, Domingues Hill, CA, cooperative learning can be distinguished from other forms of team and collaborative learning by the following six critical features (particularly the first two):

- Positive Interdependence
- Appropriate Team Assignment
- Attention to Social Skills
- Individual Accountability
- Appropriate Instructor Role
- Face to Face Problem Solving

Instructors experienced in the technique usually advise novices to begin simply, to structure learning tasks tightly, to assign specific roles to individuals, and to teach students how to work in groups. Suggestions relating to all four areas were followed in this study.

METHODOLOGY

Design

A control-experimental design was used in this action research. Two intact classes were shown to be statistically equivalent in pre-unit skill level as measured by the pretest (see statistics in the findings section below). In one class, students were taught in a lecture/ discussion approach; in the other, in a combination of lecture/discussion and cooperative learning approaches. After four weeks of instructional treatment, the pretest was administered again as a posttest. Class means were compared to identify any statistically significant difference. Class averages of individual student gains (paired differences on pre and posttests) were similarly compared. Student comments from the experimental class were condensed an analyzed.

Populations

Both classes were sections of English 270, Basic Reading Skills. Both were taught by the investigator; both met on Tuesdays and Thursdays for 1 hour and 15 minutes in the same classroom. The experimental class met from 12:30 - 1:15; eighteen students took both tests, 7 men and 11 women. The control class met from 11:00 - 12:15; twenty-three students took both tests, 10 men and 13 women.

Instruments

The test (see appendix) consisted of two parts. Part 1 required students to identify the topic sentence(s) in each of four paragraphs (40% of the score). Part 2 required students to compose a sentence which expressed the unstated main idea for each of three paragraphs (60% of the score). Thirty minutes were allowed for total test completion. The first part was objectively graded; the adequacy of answers on the second part required judgment by the investigator.

An open-ended opinionnaire administered after the posttest consisted of answers to five prompts (see Findings, below).

Procedure

The six critical features listed in the literature section above guided the development of the procedures used in the experimental class. Although both classes were given the same homework assignments and covered the same agenda during class time, and though certain explanations and discussion topics were handled in lecture/discussion for both classes, contrasting procedures were used.

The difference in treatment consisted in having students perform certain tasks in structured small group setting in the experimental class, while similar tasks were completed wither through individual deskwork or whole-class lecture/discussion in the control class. A daily summary of the common tasks and experimental procedures is provided in the appendix. An attempt was made to structure these tasks to require positive inter dependence and face to face problem solving. Carol Pottorff and Susan Rooney, reading instructors at American River College, observed the experimental section and provided helpful suggestions for refining groupwork process.

Learning teams were assigned to arrange for heterogeneity in a) main idea identification skill as measured on the pretest (see raw scores in appendix) and b) in cultural background of students. The instructor roles included explaining and modeling tasks, monitoring and assisting groups, facilitating student self evaluations and learning summaries. Tasks were sometimes explained on a handout , sometimes through a brief chalkboard lecture.

Small group social skills were introduced and practiced using handouts developed by Jim Luotto at DeAnza College, Cupertino, CA. Four skills were discussed and evaluated: reflective listening, clear sending of information, focusing on the task, and encouraging participation of group peers. Students rotated four roles ("jobs") on a daily basis: Task Facilitator, Involvement Facilitator, Recorder/Reporter, and Observer/Timer/Evaluator. The appendix includes copies of the handout explaining team jobs and procedures, the daily student self-evaluation form, and a group task sheet (more detailed than most).

Collection and Processing of Data

All test were scored by the investigator twice, each time on a different day. In accordance with advice by peer instructors, it was decided that independent graders of the test were not necessary. To increase the consistency of the investigator's grading, however, a written scoring guide for each test item was developed and a list of examples of composed sentences with their respective points was maintained. Tests were graded without student names in view. Details of the statistical processing and a tally of paraphrased student comments from the opinionnaire are provided in the Findings section below.

Limitation

Because intact classes were used and only two sections of the Basic Reading Skills course were taught by the investigator, the size of the two groups was small. Statistics used were based upon the assumption that paired differences would have a bell-shaped distribution.

FINDINGS

The raw scores of pretests and post-tests for both experimental and control classes are presented in the appendix.

Statistics

1. Hypothesis test to establish that experimental and control classes are equal, based on pretest scores.

$$H_o : \mu_1 - \mu_2 = 0$$
$$H_a : \mu_1 - \mu_2 \neq 0$$

The test statistic will be:

$$Z = \frac{\overline{X} - \overline{Y}}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

If $z <$ lower z_c $(=-1.96)$ or $z >$ upper z_c $(= 1.96)$,
then reject H . A 5% level of significance is being used.

With $\bar{x} = 55.6$, $s_1 = 19.29$, $n_1 = 18$, $\bar{y} = 47.7$, $s_2 = 18.54$, and $n_2 = 23$

$$z = \frac{55.6 - 47.7}{\sqrt{\frac{19.29^2}{18} + \frac{18.54^2}{23}}} \approx 1.32$$

Because $1.32 > -1.96$ and $1.32 < 1.96$, do not reject H_o. There is not sufficient evidence to conclude that the mean test scores on the pretests are significantly different.

2. Testing the Paired Differences

Experimental	Control
$H_o : \mu_d = 0$	No difference from pretest to posttest
$H_a : \mu_d > 0$	Posttest scores - pretest scores improved

The test statistic will be:

$$T = \frac{\overline{D}\sqrt{n}}{S}$$

A 5% level of significance is being used and the t - distribution has degrees of freedom (df) equal to n-1

With $\overline{d} = 20.7$, $s = 22.37$,
$n = 18$, and $t_c = 1.734$

$$t = \frac{20.7\sqrt{18}}{22.37} = 3.926$$

Because $3.926 > 1.734$, reject H_o

There is a significant increase in test scores.

With $\overline{d} = 25.0$, $s = 22.16$,
$n = 23$, and $t_c = 1.717$

$$t = \frac{25.0\sqrt{23}}{22.16} = 5.410$$

Because $5.410 > 1.717$, reject H_o

There is a significant increase in test scores.

3. Hypothesis test to establish that the experimental class scored higher on the posttest than the control class.

$H : \mu_1 - \mu_2 = 0$ There is no difference in posttest scores.
$H : \mu_1 - \mu_2 > 0$ The experimental class scored higher than the control class.

The test statistic will be

$$Z = \frac{\overline{X} - \overline{Y}}{\sqrt{\frac{S^2_1}{n_1} + \frac{S^2_2}{n_2}}}$$

If $z > z_c$ (=1.65), then reject H_o. A 5% level of significance is being used.

With $\overline{x} = 76.4$, $s_1 = 1.705$, $n_1 = 18$, $\overline{y} = 72.6$, $s_2 = 20.44$, and $n_2 = 23$

$$z = \frac{76.4 - 72.6}{\sqrt{\frac{1.705^2}{18} + \frac{20.44^2}{23}}} = 0.65$$

Because $0.65 < 1.65$, do not reject H_o.

Comments of Experimental Students

The 16 students responding to the opinionnaire, administered during the class session following the post-test, included the following responses, paraphrased and clustered for easier analysis: (numbers indicate frequency of mention)

What I liked about having small groups:

6 Sharing ideas
5 Getting to know classmates
3 Comparing answers with peers
2 Less fear of talking
2 Can focus on problems better
2 Can adopt best ideas of others
2 Can learn from other students
1 Is more interesting
1 Sharing of responsibilities
1 Is easier to learn
1 Goes smoothly if all are prepared
1 Others listened carefully
1 More variety in tasks
1 Learning to get along

What I liked about whole-class lecture-discussion:

3 Discussion is more detailed
2 Understand better
2 Better understanding
2 Everyone is involved
2 Discussion is more detailed
1 Can learn from others
1 Instructor explanations were clear
1 All are given a chance to participate
1 All can hear
1 More access to the instructor
1 Interesting and fun
1 Grading our homework
1 More sharing from more people
1 Instructor corrects mistakes
1 Slow pace is good
1 We get answers to questions other students asked
1 Students don't copy like they do in small groups
1 Problems are solved better

Should we continue to have small groups?

12 Yes
2 Yes, if everyone comes prepared
2 No

How could small groups be improved?

6 Make students prepare homework
4 Get students more involved, enthused
4 Make sure everyone participates
2 They don't need improvement
1 Students need to feed in information
1 Provide the correct answers
1 Have for 15 minutes or less
1 Have only one group leader
1 Regroup daily with those present

Other comments:

Instructor thoroughness in large group was too slow for capable students.
Liked not knowing whether groups would meet or not.
Liked group tasks rather than whole class correcting homework
Enjoyed the variety and the way the class was taught.
Groups were boring if students didn't come prepared.
I work better in the whole class.
The class helped tremendously, thanks a lot.
I learned a lot, thanks.

Interpretation

Statistical treatment of this study's test scores suggest that inclusion of cooperative learning is not a more effective strategy than lecture alone. I hesitate however, to interpret the findings in precise ways or to generalize beyond my particular experience with these two classes. My caution is based upon two considerations: 1) limitations of the study design and 2) my knowledge of the participants in this small sample.

My feeling is that the four week treatment period was too short for experimental students to automize small group skills to the point where there would be a measurable payoff in learning. More groupwork training was needed and learning over a longer time may have altered the results. Also, had I increased the percentage of groupwork time and been more skilled in designing group tasks and in facilitating group involvement, results may have been different. Although my personality was a constant across groups, I sensed I was more confident and skilled in the lecture/large group discussion mode than in facilitating small group work. In a sense, my delivery of an approximation of cooperative learning was more on test than the principles of the approach itself. Multiple measures on different days during a longer treatment period likely would have allowed more solid inferences concerning method superiority.

Examination of raw score gains for each student in both sections shows a wide variation of score differences. Interpretations should recognize that the test only contained seven items, that this population of students to vary from day to day in the quality of work produced, and that with such a small sample size, unusual situations may unduly affect scores. Experimental students numbered 3 and 16 of the lowest scorers on the posttest, for instance, had been under extreme stress (death in the family and bodily assault) during the study and showed much greater skill in identifying main ideas on subsequent tests.

Students also differed in their opinions about small group activity. Only 2 out of the 18 experimental students preferred not to continue with groupwork (providing students came to class prepared). Some students preferred the detail and structure of instructor-led discussion; others preferred the responsibility and freedom of peer exploration. Perhaps learning style preference is a factor determining student acceptance of cooperative learning or the amount of learning a given student may create from group involvement. If so, measures of learning style may help plan group membership and initial orientation to cooperative learning.

SUMMARY

Conclusions

1. The cooperative learning class significantly increased its skills in identifying and stating the main idea of paragraphs.
2. The lecture/discussion class also significantly increased its skills in identifying and stating the main idea of paragraphs.
3. There was no significant difference in the average skill gain between the two classes. (This may be explained in part by limitations of this study.)
4. Students varied widely in their measured improvements and in their expressed evaluations of this particular cooperative learning experience.

Summary

The main intent of this study was to discover whether adding small group cooperative learning activities to lecture/discussion in one section of a college developmental reading class during a four-week unit on identifying paragraph main ideas would lead to significantly higher test scores compared to scores of a similar section taught by the same instructor but using a whole-class lecture/discussion method without small group activities.

The data indicated that impressive learning took place in both lecture and cooperative learning sections, but that neither made significantly greater gains. The short instructional period and the inexperience of the instructor with cooperative learning methodology may have curtailed the effectiveness of experimental group instruction. Experimental student comments indicated they generally valued the small group activities, though a mix of opinions was expressed.

Recommendations

Based upon the experience and findings of this study, the following suggestions seem in order:

1. This study should be replicated with the following possible modifications: More orientation to small group skills; longer treatment period covering several units of study; higher percentage of experimental class time spent in cooperative learning groups; monitoring of relative amounts of time required by the two approaches; more detailed and structured opinionnaire; more teachers involved in paired classes.

2. College districts and individual campuses should support classroom research as a highly effective method of faculty inservice and rejuvenation. Monetary and/or release time incentives for supervised faculty research should be provided on each campus. A four semester time block would allow emphasis on clarifying the design and treatments through extensive literature search and discussion during one semester, piloting the instruments and procedures the next semester, and performing the study the following semester. Sharing results and guiding peers in new research would involve a fourth semester. Realistic time reserved for an ongoing faculty study and support group (which would in turn involve newcomers) could make the research process a vital part of campus instructional refinement.

RESEARCH FACULTY COMMENTS

Although this study did not show statistical superiority of the experimental treatment, the project was personally very meaningful in the three ways I had anticipated. I did increase my understanding, both conceptually and experientially, of cooperative learning and believe even more strongly than of the outset that it is an approach I want to continue to refine. Secondly, I find that I view my class activities now as composed of a mix of researchable variables; I conceptualize my teaching as a composite of decisions which may each be altered or explored. This is a healthy perspective for self-improvement even though time constraints allow the formal study of only a few of our many instructional acts. Thirdly, and perhaps most pleasantly, the encouraging and provocative discussions with the faculty and staff of the inter-campus research project reconfirmed for me the value and challenge of college instruction.

BIBLIOGRAPHY

Aronson, E., et.al.The Jigsaw Classroom. Beverly Hills, CA: Sage Publications. 1978.

Bruffee, Kenneth A. "The Art of Collaborative Learning: Making the Most of Knowledgeable Peers". Change. March/April 1987. p43-47

Cooper, James, et.al. Cooperative Learning and College Instruction; Effective Use of Student Learning Teams. Long Beach, CA: California State University Foundation. 1990-a.

Cooper, Jim and Randall Mueck. " Annotated Bibliography of Cooperative/Collaborative Learning Research and Practice (Primarily) at the College Level". Journal of Staff, Program and Organizational Development, Vol.7. 1989. Pg. 143-148.

Cooper, Jim and Randall Mueck. "Student Involvement in Learning: Cooperative Learning and College Instruction". Journal on Excellence in College Teaching, Vol. 1. 1990-b. Pg.68-76

Johnson, David et. al. Circles of Learning: Cooperation in the Classroom. ACSD. 1984.

Johnson, D.W., and R.T. Johnson. Learning Together and Alone: Cooperative, Competitive, and Individualistic Learning. Englewood Cliffs, NJ: Prentice-Hall. 1987.

Johnson, D.W., R.T. Johnson, and E.J. Holubec. Structuring Cooperative Learning: Lesson Plans for Teachers. Edwina, MN: Interaction Book Company. 1987.

Kagan, Spencer. Cooperative Learning: Resources for Teachers. Riverside, CA: University of California. 1988.

Kagan, Spencer. "The Structural Approach to Cooperative Learning". Educational Leadership. Dec. 89-Jan. 90. Pg. 12-15.

Newmann, F.M. and J. A. Thompson. Effects of Cooperative Learning on Achievement in Secondary Schools: A Summary of Research. Madison, WI: National Center on Effective Secondary Schools. 1987.

Radebaugh, M.R. and F.E. Kazwmek. "Cooperative Learning in College Reading and Study Kills Classes". Journal of Reading, Vol. 32. Pg. 414-418.

Rasor, Richard A. Faculty Inititated Instructional Research. Sacramento, CA: American River College. 1991.

Sharan, S. and Y. Sharan. Small Group Teaching. Englewood Cliffs, NJ: Educational Technology Publication. 1976.

Slavin, Robert E. et. al. Learning to Cooperate, Cooperating to Learn. New York: Plenum Press. 1985.

Slavin, Robert E. Student Team Learning: An Overview and Practical Guide. Washington, DC: National Education Association. 1986.

Weiner, H.S. "Collaborative Learning in the Classroom: A Guide to Evaluation" College English. Vol. 48. (5) Pg. 71-82.

Winston, R.R. Promoting Student Development Through Intentionally Structured Groups. San Francisco: Jossy-Bass. 1988.

Notes

1. For continuing updates on cooperative learning, there is a newsletter, Cooperative Learning and College Teaching and the Network for Cooperative Learning in Higher Education. Contact Dr. Jim Cooper, HFA-B316, CSU Dominguez Hills, 1000 E. Victoria St., Carson, CA 90747. Call (310) 516-3961 or 3810.

2. One may join the International Association for the Study of Cooperation in Education by writing to Drs. Ted and Nancy Graves, 136 Liberty St., Santa Cruz, CA, 95060. Call (408) 429-6550.

APPENDICES

1. Test: "Main Idea Quiz"
2. Daily Summary of Small Group Tasks
3. Team Jobs and Procedures
4. Student Self-Evaluation Form
5. Team Task for 10/15/91
6. Pretest and Posttest Raw Scores

MAIN IDEA QUIZ[1] NAME____________________

ENG. 270; HOUR_____ __ BEFORE UNIT ____AFTER UNIT

Part I: Identifying Topic Sentences

A topic sentence states the main idea of a paragraph. It says what the entire paragraph is about.

Identify each topic sentence by filling in the correct sentence number in the space provided. In the one case where there are two topic sentences, fill in both numbers.

1. [1]Preventing, not treating, mental health problems is the goal of an increasing number of programs. [2]By teaching teenagers to resist peer pressure, for example, one program helped them avoid serious problems with drinking and drugs. [3]In another program, nurses taught poor, young, pregnant women good child care. [4]These young mothers then gave better care to their babies than mothers who were not taught good child care.

   Topic sentence(s):_________

2. [1]Musical ads, powered by a hidden microchip, are becoming more common in magazines. [2]This new type of advertising, however, is not without its drawbacks. [3]Although opening the magazine starts the music automatically, many readers have no idea how to turn it off. [4]One recent Christmas, several copies of the same magazine were found in the incinerator of a New York apartment building, all playing "Jingle Bells". [5]Another problem is that mail carriers can set off a musical ad just by putting a magazine in a mailbox.

   Topic sentence(s):_________

3. [1]Parents are prepared for a new child through childbirth classes and baby-care books. [2]But older brothers and sisters have gotten no such preparation. [3]Now, however, hospitals around the country are trying to help the siblings of new babies. [4]At Cedars-Sinai Medical Center in Los Angeles, brothers and sisters are given a lesson in baby care and a tour of the maternity floor. [5]At New York's Roosevelt Hospital, they can get two-hour sessions with films, books, and toys. [6]And at Pacific Presbyterian Medical Center in San Francisco, siblings actually get to "deliver" a baby doll.

   Topic sentence(s):__________

4. [1]Even poor spellers can improve their spelling if they try a few simple methods. [2]One is to keep a list of words they are constantly looking up in the dictionary. [3]They can review and test themselves on a few of these words each day. [4]Another technique is to practice writing difficult words one syllable at a time, speaking each syllable clearly while writing it. [5]Breaking a work into its parts makes spelling a less forbidding task. [6]Finally, they can learn little verbal tricks that help. [7]One such trick is, "There's a *rat* in *separate*". 8Another is,"*Iron* is found in the *environment*." [9]Using these methods, poor spellers can become reliable spellers.

   Topic sentence(s):_________

---

[1] Adopted from Langan, John and Gary Kay, Ten Steps To Building College Reading Skills. Marlton, N.J. Townsend Press. 1989.

Part II: Writing Unstated Main Ideas

Write out the unstated main idea in each of the following three paragraphs. Hints may help you figure out the implied main idea.

For each paragraph, write a complete sentence (include subject plus verb). Also, be sure you state the main point being made about the topic (subject) of the paragraph. Write a general statement that includes most if the specific ideas in the paragraph.

5. One way to lower fat in your diet is to eliminate meats with marbling. Also, eat more low-fat dairy products, including skim milk and low-fat yogurt. In addition, remember to eat poultry without the skin, which has a lot of fat in it.

The unstated main idea of this paragraph is:

____

6. Does humor like that on *Sesame Street* interfere with children's learning? To answer that question, a researcher showed educational tapes to four groups of young children. Two groups saw educational programs that included funny parts. Two other groups saw educational programs in which silent, black screens replaced the funny parts. The children who saw the funny parts answered questions on the material much better than the other children.

The unstated main idea of this paragraph is:

____

Hint: The topic of this paragraph is the question of how________ influences ___________________.

7. A chimp by the name of Sherman participated in an interesting math experiment. He was given two pairs of cups containing chocolates. One pair contained five candies - three in one cup and two in the other. The second pair held only four candies - three in one and only on one the other. Sherman chose the pair of cups with the most chocolates 90 percent of the time, Also another chimp, Lana, can match the numbers 1,2, or 3 with a picture of the matching number of boxes 80 percent of the time.

The unstated main idea of this paragraph is:

____

Hint: The topic of this paragraph is chimps' understanding of ________________________________.

DAILY SUMMARY OF SMALL GROUP TASKS

Notes:

1. During weeks 3-5 in the semester, the experimental class met in informal small groups eight times to introduce the class to cooperative learning in a low-key manner. Specific instruction in group process was not given; students formed groups by preference or proximity. The control group worked in pairs twice during this period.

2. During weeks 6-9 the following common tasks were completed by both classes, but under different conditions. In the control class, each task was accomplished either through individual seatwork (instructor giving one-on-one attention) or, more commonly, through instructor led explanations and question-answering in the whole-class setting. Experimental class activities are noted below; group reports, correct answers, and student-identified problems were generally discussed in whole-class mode following the group taskwork.

3. As the experimental groupwork often took more time (due to task explanations, slower student pacing, and time required for group reports), the control class spent time on vocabulary development to keep the classes on parallel schedules.

Date	**Common Tasks**	**Experimental Class Expectations**
	Individuals or everyone should:	Group members should:
9/24	1. Take notes on 8 text pages.	Write consensus of good wordings.
	2. Discuss errors made on a test.	Teach each other the rationale for the correct answers.
	3. Complete selected exercises.	Select and report consensus answers.
9/26	1. Check homework against key; discuss confusions	Explain why keyed response is best; help teammates understand & verbalize clearly.
10/2	1. Critique peer-written paragraphs using evaluation guide and model paragraph	Read paragraphs aloud and reach consensus on evaluation.
	2. Complete selected exercises	Reach & report group consensus
	3. Analyze homework	Reach & report group consensus
10/3	1. Locate and either copy or paraphrase definitions for 3 terms.	Reach & report group consensus
	2. Identify and paraphrase sentences; list major support ideas.	Reach & report group consensus

10/8	1. Discuss differences in homework paraphrases of topic sentences.	Reach & report consensus
	2. Discuss differences between student paraphrases and model.	Summarize and report differences.
10/10	1. Discuss answers to returned tests.	(No groupwork this day)
10/15	1. Systematically analyze paragraphs in text in preparation for test.	Follow instructions on Team Task Sheet. (see appendix)
10/17	1. Continue above using paragraphs with and without stated main ideas.	Follow streamlined Sheet procedures.
10/22	(Post-test)	(No groupwork this day)

Classroom Observations

1. Until students became accustomed to the group procedures, appreciable class time was spent in explanations of process rather than in the process itself. Students were just "jelling" as groups and were beginning to work effectively when the treatment period was over. In a sense, students were tested for impact of cooperative learning before they had really used the learning structure effectively.

2. Much of the groupwork was dependent on completion of homework. Some students came unprepared and sabotaged the group process. Sometimes unprepared students were denied membership in the group; at other times the prepared members oriented and guided the unprepared. Neither approach produced the desired learning and interaction; neither was fair to the prepared students.

3. Student ability to focus and contribute improved (in investigator's opinion) during the treatment period and students appeared glad to assume the four jobs and granted peers their surrendered roles. In a longer study, students cold keep the same job for several days to become skilled at it before switching to another (while experiencing all jobs).

TEAM JOBS

Task Facilitator (T)	Make sure each task is completed by team. Help team get organized and keep going (keep focus without bossing!)
Involvement Facilitator (I)	Make sure everyone participates; draw out quiet members; limit talkers. **Before next class starts:** Pick up folder; copy names of those present; write new jobs (rotate); give folder to new Recorder.
Recorder/Reporter (R)	Copy tasks from board to Team Sheet. Write down team consensus answers as Task Facilitator gets team to dictate. Give any oral report to class; write team responses on board if needed.
Observer/Timer/Evaluator (O) (could be same person as Involvement Facilitator if only 3 are present)	Remind team members of their jobs. Remind Task Facilitator of time limits, slow progress, side tracking. Fill in "Consensus Team Evaluation" part of Team sheet. Be sure individuals fill in any individual evaluations. Return folder to instructor when done.

USUAL TEAM PROCEDURES

Start-up

- Last time's "I" should pick up folder, copy names and new jobs.
- "R" copies task while team gets materials ready.
- "T" gets group to agree on procedures & time limits appropriate for the day's tasks, then gets group to focus and begin.

Task Work

- Everyone help each other with both jobs and task (see above).

Wrap-up

- "T" and "R" be sure all tasks are done and recorded.
- "O" solicits and records realistic team evaluation numbers, collects individual evaluations, returns folder.

STUDENT SELF-EVALUATION OF TODAY Name______________________________

English 270 Team Letter_____ Date_______________

MY JOB

Circle: Task Facilitator Involvement Facilitator

Recorder/Reporter Observer/Timer/Evaluator

Comments: (You must write something for both. See job list.)

One Thing I Did Well Today:

What I Could Have Done Better:

My overall rating of how I did on this job today: (See job list)

Extremely Effective	Good Solid Contribution	A Bit Less Than Satisfactory	Poor: Job Was Hard. I Need Practice/Help.

MY ASSERTIVE TEAM SKILLS

Reflective Listening:

- I concentrated when each student spoke & gave positive eye contact.
- I listened for his/her main point & concrete details.
- I avoided distractions & blocks (judging, joking, etc.)

Excellent Good Less Than OK Poor

Clear Sending:

- I clearly stated my main ideas.
- I supported them with concrete (specific) examples/reasons.
- I avoided "turnoffs" (see sheet)

Excellent Good Less Than OK Poor

Focusing On The Task:
Excellent Good Less Than OK Poor

Encouraging Others to Participate Equally:
Excellent Good Less Than OK Poor

TEAM TASK 10/15/91

Assigned Paragraphs:

Team___ p. 82, #1	Team ___ p.83, #3	Team ___ p.86, #B-2
Team___ p.82, #2	Team ___ p.86, #B-1	

---

1. On team sheet, mark absences and add any names. Assign jobs.

2. Involvement Facilitator read assigned paragraph aloud while everyone marks transitions. Agree on them?

3. Agree on the most important words or phrases to underline. Everyone underline these in their own books.

4. Now agree on where to write a small number (1,2,3 etc.) on the lines just before each different idea which could support a topic sentence.

5. Agree on a wording for the topic. Everyone write this in their left book margin by the paragraph.

6. Observer read each of the 4 multiple choice possibilities for a good topic sentence (a try at stating the unstated main idea).

   Team should agree on and them write one of these letters in front of each multiple-choice letter:

M - This is a good main idea statement(covers the supporting ideas which the team underlined and numbered).
B - This is a poor main idea statement (because it is too broad).
N - This is a poor main idea statement (because it is too narrow).

7. Team agree on a good way to teach (explain) the paragraph to others:
   Ask them questions to guide them through it?
   Draw a little chart or diagram?
   List the important supports so they stand out?
   Some other approach? (Use your imaginations!)

8. Each member should practice presenting the paragraph to one other team member.

9. Observer get team to agree on evaluation numbers and write them. **Don't just give all ones! Save ones for superb work. Most groups should probably evaluate with twos or threes.**

10. **If there is time left over, begin homework on p. 187-9, using the same approach, but having to create your own topic sentence.**

PRE- AND POST-TEST SCORES

EXPERIMENTAL			CONTROL		
Student	Pretest	Posttest	Student	Pretest	Posttest
1	84	80	1	77	65
2	70	100	2	74	90
3	70	40	3	73	85
4	70	75	4	72	70
5	69	85	5	65	100
6	65	90	6	60	75
7	65	80	7	60	95
8	64	65	8	60	70
9	61	60	9	53	95
10	60	100	10	50	50
11	55	65	11	50	60
12	54	80	12	4750	80
13	54	90	13	45	65
14	54	85	14	40	75
15	50	90	15	40	40
16	30	55	16	40	90
17	15	85	17	40	100
18	10	50	18	40	95
			19	35	40
			20	30	45
			21	15	55
			22	15	90
			23	15	40

Pretest	Posttest	Pretest	Posttest
x = 55.6	x = 76.4	y = 47.7	y = 72.6
s = 19.29	s = 17.05	s = 18.54	s = 20.44
n = 18	n = 18	n = 23	n = 23

Paired Differences	Paired Differences
d = 20.7	d = 25.0
s = 22.37	s = 22.16
n = 18	n = 23

GRAMMAR CHECKING SOFTWARE IN THE WRITING LAB

A RESEARCH PROJECT CONDUCTED BY
PHIL HUTCHEON
COMMUNICATION SKILLS DIVISION
SAN JOAQUIN DELTA COLLEGE
FALL SEMESTER 1991

OVERVIEW

Any instructor of composition who read Mary O'Reilley's article on student-centered teaching in College English surely recognized the impulse she alluded to when she mentioned that at various moments in the throes of correcting stacks of quasi-literate student essays, she has been tempted to apply to her legions of "developmental" writers the same solution Joseph Conrad's famous Kurtz contemplated in Heart of Darkness for the problem of the "ignorant savages" of Africa: "Exterminate all the brutes!" (142) And anyone who has wrestled with the problem of teaching college students word processing skills in conjunction with "evolving" software has undoubtedly entertained a similar impulse toward the machines involved--exterminating those brutes, too, seemed like a good idea to me more than once during the course of my recent classroom-based research project in the computer room of the Writing Laboratory at San Joaquin Delta College. In brief, my project involved dividing a section of English 79: Preparatory English--the course immediately preceding English 1A in Delta's composition curriculum--to see if students who came to the Writing Lab to use the MicroSoft Works 2.0 word processing program and the grammar-checking program Correct Grammar could learn to eliminate major sentence errors, specifically run-ons and fragments, from their compositions more effectively than could students who did not come to the Lab but who merely revised their compositions by hand.

There were several motives for this project. First, I had been intrigued by the possibilities of using computers to entice students to approach the task of revising their papers with greater enthusiasm ever since I attended a conference at San Francisco State University in which Professor Deborah Holdstein talked about the excitement that even students who are reluctant writers often feel when invited to use a computer in a classroom setting to help them improve their writing. Instructors in a pilot program at the University of Washington, where as many as a dozen sections of computer-integrated composition courses are now offered as options in the standard expository writing sequence, have reported similar enthusiasm on the part of students (Gelernter D14). At the same tine, along with many other longtime composition teachers, I was skeptical about the actual kinds of writing improvements that would take place with the use of computers, and I was curious to see what the problems would be like in a classroom full of students with rudimentary writing skills and rudimentary computer skills. Holdstein, in fact, had given warning of this "double bind," indicating that the frustration level of students new to the use of computers might indeed merely compound their already substantial problems in producing a competent essay. Citing this problem, she counseled instructors not to take on the challenge of using any computer software "until you know the program perfectly."

This caveat I decided to ignore. I shall confess here that my own computer skills are also in the rudimentary category, and in general my mechanical aptitude ranks even lower than that of your average English teacher/professional bookworm and how-many-of-us-will-it-take-to-screw-in-this-light bulb-type (I can't usually locate the latch to lift the hood on my car, for example). I can, however, type in and print out an essay on a computer, and after a conversation with Dr. Marilyn Faulkenburg at Menlo College, who has been using word processing in her composition classes for a number of years, I decided that Holdstein's advice was overstated. Dr. Faulkenburg assured me that she refines her knowledge of the software as she proceeds in the classroom and that students often help her--and each other--to discover and cope with the quirks and glitches that invariably occur.

Given this reassurance, I set out to find a software program that would help me to teach pre-1A students to recognize two of the most common and most grievous errors in their writing. This turned out to be the most frustrating part of my project. A survey of the available software revealed that only a few grammar-checkers even attempt to recognize run-ons and fragments; with those that do make this attempt, the results are often far from accurate. The software program which had been most frequently recommended to me by other writing teachers, Grammatic Mac, does not attempt to identify run-on sentences, nor does another widely used interactive grammar-checker, Sensible Grammar (Piller 139). For the program I ultimately selected, Correct Grammar, I found widely divergent appraisals: one reviewer placed it first among all available grammar software programs and called it a "model of interactive grammar-checking" (Landau 115), while another reviewer suggested eliminating it from consideration first because it is insufficiently interactive (Piller 143). At this point, I said "Thanks for clearing that up," or something like that, and decided to find out for myself. What I discovered, thanks to a demonstration by Joan Bailey, who manages the computer lab at Menlo College, was that Correct Grammar for WordPerfect has significant advantages over the version of Correct Grammar that is designed for use with Macintosh. The Wordperfect version, for example, provides a marked print-out of all of the errors on a page, whereas the Correct Grammar for Macintosh provides no print-out option other than the standard print-screen command (option shift 4), and even then provides a print-out that highlights only one error at a time. In spite of this significant shortcoming, since Delta's Writing Lab is equipped with Macintosh computers and Microsoft Works software, I decided to order a demonstration copy of Correct Grammar for one terminal, print out the marked copy of each sentence structure error made by students in the experimental group, and proceed.

METHODOLOGY

After the first writing assignment of the semester, I divided the class into two groups of fourteen by flipping a coin (I assuaged the unelected by giving them a tour of the Writing Lab in conjunction with a subsequent assignment). This assignment required students to write a substantial paragraph about the worst teacher they ever had. It's a topic about which students generally have plenty to say, and from which I learn plenty, too--including some of the reasons why students have reached college level without being able to write a coherent paper. Once the whole section had written the first draft of this assignment by hand in class, I reviewed the papers, made written comments on organization and development of ideas, and discussed problems of run-ons and fragments in class without marking these specific items on the first drafts. I then brought the experimental group to the Writing Lab, where they were able to view the print-outs of their sentence structure errors as marked by Correct Grammar and to attempt to correct these errors in a second draft, using the computers. The control group attempted to find their sentence structure errors without this aid and to correct them in a second handwritten draft.

FINDINGS

I anticipated that the experimental group would perform significantly better in this task with the aid of the grammar-checker, but these expectations were not confirmed by the results of the experiment. The experimental group reduced the number of sentence structure errors by 38% (from 24 to 15), and the control group reduced the number of errors by 36% (from 17 to 11), so the results were nearly identical, even though the experimental group received what appeared to be significantly more assistance with the problem sentences.

There were several limitations that may help to account for the results of the experiment. First, the grammar-checker did not always give the students correct messages about the sentences it marked. For example, Correct Grammar marked the sentence "His job was to teach me about Biology, but believe me, he did everything but teach me about Biology" as a run-on requiring the insertion of a conjunction or a semicolon, when in fact only a comma between "but" and "believe" is needed to correct the sentence. Similarly, Correct Grammar marked the sentence "After that I sat in the corner and didn't say a word the whole year" as a fragment, commenting that "this sentence does not appear to contain an main clause," when in fact the sentence--a remarkably cogent summary for the paragraph in question, I think--needs only a comma after the introductory modifier, and some might argue that even that comma is superfluous. End result: The student writes a powerful sentence with a minor flaw, and the grammar-checker confuses him by telling him it's a fragment. A more common problem was the substantial number of sentence errors (14) that Correct Grammar failed to mark, which in fact exceeded the number of errors that it marked correctly (10). In one student's paragraph, consisting of thirteen sentences, Correct Grammar failed to mark three run-on sentences--and the student repeated them all in her revision. The comma-splice run-on in which the second independent clause begins with a pronoun seems to be particularly difficult for this software program to identify; perhaps I should have anticipated this problem when I read the following sentence in the manual that accompanied the Correct Grammar software: "Caution should be used when turning off a class, you might be turning off hundreds of rules" (37). The program did a significantly better job of spotting fragments, but still missed incomplete transitional phrases as obvious as "Back to the subject of teaching," and "Four years of great teachers then this," which many teachers would find objectionable or would at least wish to see flagged as deviations from standard academic style.

Considering these inaccuracies, on top of the limited interactiveness of the program and the extreme cumbersomeness of obtaining useful print-outs, it was easy for me to decide on the basis of this experiment not to request installation of Correct Grammar for the Macintosh in Delta's Writing Lab. In addition to answering that question resoundingly in the negative for me, however, there were some welcome positive side-effects of the experiment. I had been concerned about the possibility of some students being reluctant to use the computers or even being resentful of this requirement, but instead I found that nearly all of the students in the experimental group were enthusiastic about the opportunity--and were even tolerant of the imperfections of the software (perhaps in some perverse way they were reassured by the notion that "the computer screwed up, too"). There was one middle-aged re-entry student who experienced some initial trauma as a result of the experiment. It turned out that she had never even touched a typewriter before. When she first came into the lab, she sat in front of the computer screen as if transfixed by it, and she refused to lay her hands upon the keyboard unless I sat right next to her and told her what to do on every stroke. When I went away to help other students, she simply sat and waited for me to come back. Her revision, needless to say, did not proceed swiftly. Yet even this student, when I surveyed the experimental group afterward about whether they were ready to use word processing to produce their papers, wrote, "I believe I can learn to do it with your help."

Ironically, it may have been my own relative lack of expertise that enabled me to help some students. A number of them commented that in previous classroom situations when they had been exposed to word processing, they had quickly become confused by the number, the complexity, and the speed of the maneuvers demonstrated. Several students noted that in introductory sessions in computer classes they quickly got lost when they were shown how to write programs, or to reset tabs or margins or typefaces before they had ever typed in any text. "In the Writing Lab you kept it simple," one student commented, "and I was able to get something typed up and work on correcting my mistakes. Last time I tried, I couldn't even figure out how to get into this program."

Most of the responses were comparably positive, and some were even stunning in their stark ingenuousness: One student indicated that he did not know how to type and had never taken a class in which computers were used, but exclaimed, "I want to learn!" Others wrote poignantly of their embarrassment about their handwriting or spelling, and of their hopes that the computer would help them to solve these problems. A few students expressed their enthusiasm for the computer rather too grandly for my liking, and I had to spend some time pointing out to the class that the word processing program we were working with would not, as some of them claimed, help them to "organize" their essays more effectively.

In short, even though this experiment did not confirm my expectations, I learned a lot from it. The bad news is that grammar-checking software appears to be still very much in the evolutionary stage and to cause more problems than it solves when applied to run-on sentences and sentence fragments. The good news is that students responded enthusiastically and productively to the use of the Writing Lab to introduce them to work processing skills in conjunction with assigned revision of their compositions.

WORKS CITED

Correct Grammar 2.0 for the Macintosh. San Francisco: Lifetree Software Inc., 1990. [Author's note: Lifetree has been replaced by Wordstar International of Novato as distributor of this software.]

Gelernter, Carey Quan. "A Spur to Young Writers: College Freshmen Find Computer Makes It Easy to Revise, and to Speak Their Mind." San Francisco Examiner 23 June 1991: D-14. Reprinted from Seattle Times.

Landau, Ted. "Proper English." MacUser Sept. 1991: 113-124.

O'Reilley, Mary Rose. "Exterminate . . . the Brutes'-- And Other Things That Go Wrong in Student-Centered Teaching." College English 51:2 (Feb. 1989): 142-146.

Piller, Charles. "Polishing Your Prose." Macworld Aug. 1991: 138-144.

THE CRC PENPAL PROJECT: FOSTERING CROSS-CULTURAL INTERACTION

A RESEARCH PROJECT CONDUCTED BY
MARLO McCLURG
ESL DEPARTMENT
COSUMNES RIVER COLLEGE
FALL SEMESTER 1991

Participants: **CRC Faculty**
Rhonda Farley, ESL; Lisa Marchand, ESL; John Pratt, English; Bill Karnes, English; Dennis Hock, English; Paul McCormick, Sociology; Arnie Zimmerman, History

OVERVIEW

Introduction

The purpose of this project is to foster intercultural communication between English as a Second Language (ESL) writing students and English as a native language (ENL) students in other courses across campus. The research tools were designed to determine if: 1) students find this project valuable, and 2) students change their cultural attitudes with just a semester's communication through penpal letters.

Historically, ESL students have expressed their desire to make "American" friends. They are very eager to learn about American culture and attitudes, but find it very difficult to make friends. The most common explanations for this from ESL students is that they are shy or embarrassed to interact because of their limited English. Conversely, ENL students often perceive ESL students in groups, speaking their native languages, as "clannish" and not desirous of learning English or becoming "Americans", often leading to "English Only" attitudes.

Assumption

If we could provide an avenue for ESL students to communicate with ENL students anonymously, ESL students could express themselves openly, ask cultural questions, and make a "friend". ENL students, on the other hand, might gain insights into the barriers faced by ESL students and become more empathetic with the tremendous tasks ESL students face in trying to become full members of the American society. In addition, attitudes held by both the ESL and ENL students would be reflected in their letters. If students could ask questions and communicate freely, our assumption was that they may express stereotypes which might be changed in response to their dialogues.

By using a pre and post Student Attitude Questionnaire, we would be able to compare any differences. In addition, we would ask questions on another form to which students could respond more freely and we would know whether this is a project to continue to develop, or abandon.

METHODOLOGY

Design

We chose three ESL writing classes in which students could write penpal letters in lieu of their journals. We then identified English 1A classes with John Pratt, Bill Karns and Dennis Hock. In addition, two other instructors, Paul McCormick and Arnie Zimmerman were willing to ask for volunteers in their classes to participate. In the second week of class, we explained the concept of the Penpal Project, our goals, (see appendix #1) and provided some guidelines of types of questions and problems to anticipate. Next, we had our ESL students write a "Dear Penpal" letter to introduce themselves, stating specifically what they wanted to learn about. We then met with the other instructors and matched students, and folders were made with the ESL and ENL students' and instructors' names on the front of each folder. Because this was a major part of the ESL writing classes each section had a different color of folder so that each instructor could easily identify her folders. There was not a specific time-line given for the turnaround process. In the beginning, the penpal folders were distributed to the students who were given two class meetings to return the journals. Later, due to late journals and students dropping, a variety of procedures were followed. If the penpal of a student dropped the class, volunteers were sought to replace them; for our ESL classes, we had support staff in the lab who became the second correspondent. For the other classes, highly motivated students had two penpals, or two students whose penpals dropped at the same time were paired with one another.

Instruments/Procedures

We designed two instruments:

1) Student Attitude Survey (see appendix #2)
This has 50 attitude questions and six biographical questions. We administered these in our classes, using scan-tron forms at the beginning and the end of the semester. This is a Likert-type attitude survey with questions: strongly agree, agree, disagree, strongly disagree. In addition, we had seven (7) categories, which will be discussed later in the analysis.

2) End of Semester Questionnaire (see appendix #3)
This has ten open ended questions so that students can write informational responses to evaluate the penpal experience. Students were encouraged to speak very openly, knowing their responses would be anonymous and help in improving the project.

Statistics

All of the classes were combined for one large sample for a comparison between the pre and post responses. The four response possibilities were reduced to two: agree or disagree. The agree responses became "successes" for the statistic (1).

$$\hat{P} = \frac{\text{Sum of A + B}}{\text{Sum of A, B, C, D}}$$

The disagree responses became "failures" for the statistic (2).

$$\hat{P} \text{ (should be) } \frac{\text{Sum of C + D}}{\text{Sum of A, B, C, D}}$$

In all the tests, the following definitions were used:
P_1 = the proportion of the population of POST responses
P_2 = the proportion of the population of PRE responses

Therefore, $P_1 - P_2$ is the theoretical difference in the proportion of responses for such questionnaires to all students that would use the treatment called "Penpal". The following null and alternate hypotheses were:

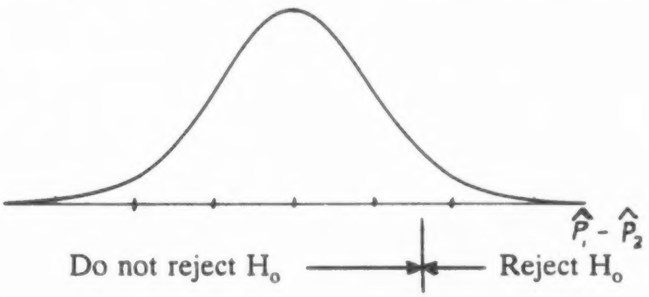
H_o: $P_1 - P_2 = 0$ There is no difference in the properties as a result of the treatment.

H_a: $P_1 - P_2 = > 0$ There is an increase in the properties of "successes" as a result of the treatment.

A 5% level of significance was used for each test; thus $\alpha = 0.05$. The critical z sum is 1.65. For each test, the test statistic used was:

$$Z = \frac{\hat{P}_1 - \hat{P}_2}{\sqrt{P^* (1-P^*)}\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

Below is the general picture of z-distribution as it relates to the test:



80

Note: Not all changes could be read as "successes" because we occasionally worded the same question, in both negative and positive attitude, as "agree"; that is, if the change is in agreement of a negative attitude (based on the goals of this project) then it is a "failure", not a "success".

Analysis

A. We listed our questions under the seven categories, as follows:

1. Attitudes toward racially different people.
   12, 18, 28, 32, 36, 39, 43, 47
2. Attitudes reflecting willingness to integrate.
   3, 5, 9, 11, 16, 23, 38
3. Attitudes reflecting desire to segregate.
   a, 6, 8, 33, 40
4. Attitudes related to school.
   4, 10, 15, 22, 27, 32, 37, 38, 39, 40, 41, 43, 47, 48
5. Belief in stereotypes.
   2, 7, 13, 14, 19, 24, 26, 29, 30, 31, 34, 42, 44
6. Attitudes toward gender equity.
   17, 20, 25, 49, 46
7. Attitudes toward English only.
   48, 50, 21, 19

B. We then highlighted the questions which showed a significant pre and post response, which were:

1. 39, 47
2. 9, 16
3. 6, 8,
4. 10, 48
5. 7, 14, 24, 42
6. 25, 46
7. 48

C. We listed the percentage of change for each question and determined if it was a "success" or "failure" according to our goals for this project.

FINDINGS

1. See (appendix #4) for the statistical data for each question on the Student Attitude Questionnaire.

We had 14 questions which showed a significant change. Of those, two showed a decrease in agreement; however, agreement wasn't necessarily a "success" for us. Once we got to a close analysis of the students' responses, it made us aware of the ambiguity of our questions, or the meaning of the students' responses. We realized that statistics are important, very important, but that for them to be significant, the instruments must be finely honed. Our analysis of our Attitude Questionnaire made us aware of the imbalance we had, as well as the ambiguity we created in some of our questions in each category.

2. See (appendix #5) for the common responses to the open-ended questions.

In general, comments were very positive. Both ESL and ENL students thought the following were positive: letters were more meaningful than journals; anonymity encourages honest, direct questions; students definitely interacted with someone they might never have had the chance to meet; awareness of the complexity of English and struggles facing newcomers rose significantly; students wrote freely, knowing that their grammar would not be corrected; an appreciation for having been born in the United States; open dialogues about stereotypes which rarely happens without anonymity , took place.

On the negative side, many students expressed the following things that they would like: shorter turnaround times and more frequent letters; time outside of class to read and respond - in class writing did not provide the opportunity to reflect and respond; suggest specific writing topics so the letters aren't superficial; have more advance planning so that the letters are part of the grade to make people more involved and committed, thus generating letters of substance; do something about drops so students who were committed would not get paired with people who drop; a party at the end, specifically for this project, so they could meet their "mystery" friends.

SUMMARY

It was very rewarding to be involved in this research project at this time. As an ESL department, we had already planned to do this project, but we would not have had the statistical analysis done, and that forced us to give a much more "scientific" look at the data we collected. Instructors are continuously trying out new ideas to improve their classes and programs, but rarely have the expertise and time to devote to a careful analysis of the results. The time, information, and expertise provided at the end of this project to our staff because of my involvement in the Classroom Based Research Project is immeasurable. The three of us in the ESL Department had already committed to making a presentation at the CRC Instruction Improvement Days activities and another one at the TESOL Conference in Vancouver, BC in March. When we met to prepare for our first presentation, the statistical report was the catalyst for an honest, in-depth analysis of the data we had gathered:

1) Our questionnaire didn't have equal distribution in our categories, so some were measured better than others;

2) Some of our questions were ambiguous, so the results became meaningless. Some were too broad and some too limiting;

3) Scan-tron questionnaires, no matter how well designed, are not enough; that is, an evaluation of any experience must provide students an opportunity to express their own thoughts and impressions for improvement.

4) A project needs to be evolutionary; improvements can always be made, but it is very important to have good evaluation tools to analyze carefully. Good tools and careful analysis are imperative; consequently, changes can truly reflect a response to the feedback from the participants for improvement of the teaching/learning experience - the real goal and success of in-class research!!

Appendix #1

THE PENPAL PROJECT

What is a "penpal"?

People who write letters to each other are called penpals. Unlike friends who begin to write one another after moving apart, most penpals have never met face to face.

Why do people want to write letters to a penpal?

There are many reasons why a person might want to write letters to a stranger. For example, writing to a person who lives in another country can be a good way to learn about another culture. It is a way to find out how the world seems to a person who has a different language and different customs.

What is the Cosumnes River College Penpal Project?

The Penpal Project at CRC is a writing activity which pairs students in English as a Second Language (ESL) classes with students in other classes who are native speakers of English. Just like other penpals, the students in the project have never met each other.

What will the penpals write about in their letters to each other?

At first, the students will write about their interests, their families, their studies and their goals for the future. They also might tell one another about some of their memories from childhood. Later, students in the project will write to each other about cultural issues and share points of view about American social problems.

What are the goals of the Penpal Project?

Non-native students will have an opportunity to improve English reading and writing skills as well as learn more about American customs and points of view. Native speakers of English will have an opportunity to learn more about the life of an immigrant American and develop awareness of another culture. Best of all, each penpal in the project will have a chance to make friends with someone who he or she might never have met otherwise.

Which students will be involved in the project?

All Intermediate ESL composition students will write to a native speaker of English who volunteers to become a penpal. These penpals will be selected from among classes such as anthropology, intercultural communication, or English.

Here are the answers to some of the questions other teachers have asked us about the project:

How will we know if native-speaker students have changed their cultural attitudes following participation in the project?

Native speaker students will complete a survey of cultural attitudes at the beginning and then again at the end of the semester. One teacher suggested that the students write an evaluation of their experience. Apart from the survey, however, feedback from native speaker students will vary from class to class depending on the instructor's goals.

Should I tell my native speaker students to correct the ESL students' grammar?

NO; in fact, emphasize the importance of responding to the content of the ESL students' letters, not the form. In cases where the ESL letter has parts that the correspondent can't understand, recommend that he or she write something like, "I'm not sure what you meant by '(the unclear passage)'. If you meant '(native speaker's guess)' then I think....."

Can my students write about their stereotypes, anger and biases for or against the culture to which their penpals belong?

Definitely. Because the correspondents are unknown to one another, this should be a forum for candidly breaking down misconceptions and sharing perceptions. ESL students will also be encouraged to discuss any negative feelings they have toward the majority culture.

How will teachers communicate with one another about their observations of the progress of the project?

Although the original plan was to have teachers remain aloof from the interaction between student correspondents, at least two teachers will record their experiences in their own correspondence journal to stay informed of writing prompts and so forth.

Will students ever be introduced to their penpals?

All students (and teachers) participating in the Penpal Project will be invited to a social event at the end of the term. Hopefully, more than a few intercultural friendships will be born.

If you have other questions about the Penal Project, or if you are interested in involving students from your classes, please contact Rhonda Farley (ex. 378), Lisa Marchand (ex. 203), or Marlo McClurg (ex. 206) before August 29th. ESL students have already written their first letters and are eager to get a response!!

WHY?

To foster awareness of diversity on campus

To infuse diversity across the curriculum

To encourage interaction between ESL & ENL speakers

To foster friendships between ESL & ENL speakers

To permit freedom to express stereotypes

To make writing meaningful

To enable free expression through anonymity

To heighten awareness of barriers created by limited English skills

To allow ESL students to ask questions about American culture

To allow ENL students to ask questions about the target culture

To enable "individuals" to represent cultural perspectives

THE COSUMNES RIVER COLLEGE PENPAL PROJECT
STUDENT ATTITUDE SURVEY

The Penpal Project is, in a large sense, an approach to broadening students' cultural attitudes. Please take a few minutes to read the following statements and tell us how closely you agree with the ideas they express:

1 = strongly agree 2 = agree 3 = disagree 4 = strongly disagree

---

1. People should marry within their own race.

2. When I know what country a person comes from, I can make good guesses about whether I will like that person or not.

3. We should not limit the number of people from other cultures coming into our country.

4. There are no ethnic differences in our school.

5. I would accept members of another race as a family member if one of my cousins, brothers, or sisters were to marry outside of our ethnic group.

6. People from different races should never marry one another.

7. People of a particular race generally behave like others of that race.

8. It is okay for people from different races to marry so long as neither the man nor the woman is a white person.

9. Whites should feel free to marry non-whites.

10. This college invites speakers to speak about their ethnic groups.

11. I accept people of other races as close personal friends.

12. When I am in neighborhoods where most of the people are not of my race, there is a good possibility that I will be attacked.

13. Refugees are only here to take advantage of the American people.

14. Immigrants are taking our jobs.

15. The library and resource center should have more materials about ethnic groups.

16. I like having people of other cultures in my neighborhood.

17. Divorced women are unlucky and sad.

18. I am afraid that some white people might hurt me.

19. People who don't speak English well are usually pretty stupid.

20. Women should obey their husbands.

21. If people can't speak English well, they shouldn't be allowed to study in our college.

22. All ethnic groups are treated equally under the rules of our college.

23. People of all races and ethnic origins should be welcomed as immigrants to America.

24. Most crimes are committed by people who are not white.

25. A woman should worry about finding a good husband to take care of her.

26. The trouble with immigrants is that they don't act the way we do.

27. One or more ethnic groups are favored by the college administration.

28. I am afraid that some people who are not white might hurt me.

29. White families hold together well.

30. The trouble with Americans is that they don't try to understand people who are different from them.

31. Western peoples are more scientific than non-western peoples.

32. Ethnic groups are trying to influence the curriculum of our college.

33. The US government should try to find a way for people from other countries to be sent back to where they came from.

34. A problem with Americans is that they haven't got morals.

35. Arranged marriages last longer than love marriages.

36. If a person from a particular culture-group moves into a neighborhood, others like him or her will inevitably follow.

37. Learning styles are the same among all ethnic groups.

38. I like going to classes with people from other cultures.

39. Racial discrimination in schools makes it hard for immigrants to learn English.

40. The high crime rate in cities is the result of the high number of immigrants recently coming into America.

41. The college staff accurately reflects the ethnic composition of our community.

42. Primitive peoples are dirty.

43. Admissions standards for colleges should be lowered for minorities.

44. The trouble with immigrants is that they are lazy.

45. I would want my son or daughter to marry a white person.

46. Immigrants should try to become as "American" as possible.

47. Non-western history and literature are not relevant to what we should be taught in school.

48. It is important for children to learn more than one language.

49. College is more necessary for men than it is for women.

50. English is the only language people living in America need to know.

Answers to the following questions will help us calculate the results of the survey:

51. My native language is:
A = English B = Not English

52. I consider myself to be:
A = White B = Hispanic C = Asian D = Black E=Other

53. I was born:
A = in this country B = in a different county

54. I came to America:
A = as a baby B = less than 5 years age
C = more than 5 years ago D = I was born here

55. My parents immigrated from a different country:
A = neither parent B = one parent C = both parents

56. At home, I usually speak:
A = English B = a different language

Appendix #3

THE CRC PENPAL PROJECT
END OF SEMESTER QUESTIONNAIRE

Teacher's Name:________________________________

Directions: Please answer the following questions in one or more complete sentences. Do not skip any questions.

About how many letters did you write to your penpal?

How long did you usually have to wait for a reply to your letters?

Do you feel that this was an interesting assignment? Be sure to explain why.

What did you learn from your correspondence with your penpal?

In your opinion what did your teacher expect you to learn from the Penpal Project?

Do you feel that the project helped you to learn what the teacher expected you to learn?

In your opinion, what was good about the Penpal Project?

What advice would you give to help improve the project in the future?

Did your penpal ever write anything that hurt your feelings? If so, please explain:

What is your native language?

Appendix #4

HYPOTHESIS TESTS

1.	$p^* = 0.29...$	$z = -0.75$	Do not reject
2.	$p^* = 0.22...$	$z = 1.14$	Do not reject
3.	$p^* = 0.60...$	$z = -1.68^*$	Do not reject
4.	$p^* = 0.44...$	$z = 1.10$	Do not reject
5.	$p^* = 0.85...$	$z = 0.00$	Do not reject
6.	$p^* = 0.17...$	$z = -2.18^*$	Do not reject
7.	$p^* = 0.49...$	$z = 2.73$	Reject H_o
8.	$p^* = 0.40...$	$z = 4.03$	Reject H_o
9.	$p^* = 0.78...$	$z = 3.14$	Reject H_o
10.	$p^* = 0.67...$	$z = 2.62$	Reject H_o
11.	$p^* = 0.81...$	$z = 1.42$	Do not reject H_o
12.	$p^* = 0.28...$	$z = -0.30$	Do not reject H_o
13.	$p^* = 0.15...$	$z = 0.94$	Do not reject H_o
14.	$p^* = 0.17...$	$z = 3.08$	Reject H_o
15.	$p^* = 0.77...$	$z = 1.30$	Do not reject H_o
16.	$p^* = 0.81...$	$z = 2.28$	Reject H_o
17.	$p^* = 0.33...$	$z = 0.73$	Do not reject H_o
18.	$p^* = 0.22...$	$z = 0.49$	Do not reject H_o
19.	$p^* = 0.10...$	$z = 0.45$	Do not reject H_o
20.	$p^* = 0.34...$	$z = 0.00$	Do not reject H_o
21.	$p^* = 0.18...$	$z = -0.18$	Do not reject H_o
22.	$p^* = 0.70...$	$z = 1.05$	Do not reject H_o

23.	$p^* = 0.77...$	$z = 1.15$	Do not reject H_o
24.	$p^* = 0.26...$	$z = 2.33$	Reject H_o
25.	$p^* = 0.44...$	$z = 1.92$	Reject H_o
26.	$p^* = 0.33...$	$z = 0.58$	Do not reject H_o
27.	$p^* = 0.33...$	$z = -1.01$	Do not reject H_o
28.	$p^* = 0.29...$	$z = -0.15$	Do not reject H_o
29.	$p^* = 0.27...$	$z = -0.15$	Do not reject H_o
30.	$p^* = 0.59...$	$z = 1.53$	Do not reject H_o
31.	$p^* = 0.26...$	$z = -0.62$	Do not reject H_o
32.	$p^* = 0.30...$	$z = -0.74$	Do not reject H_o
33.	$p^* = 0.18...$	$z = 1.12$	Do not reject H_o
34.	$p^* = 0.33...$	$z = 1.16$	Do not reject H_o
35.	$p^* = 0.32...$	$z = 1.46$	Do not reject H_o
36.	$p^* = 0.42...$	$z = 0.28$	Do not reject H_o
37.	$p^* = 0.49...$	$z = 1.23$	Do not reject H_o
38.	$p^* = 0.77...$	$z = 1.47$	Do not reject H_o
39.	$p^* = 0.55...$	$z = 1.92$	Reject H_o
40.	$p^* = 0.26...$	$z = -0.16$	Do not reject H_o
41.	$p^* = 0.49...$	$z = 1.64$	Probably reject H_o
42.	$p^* = 0.17...$	$z = 2.33$	Reject H_o
43.	$p^* = 0.26...$	$z = 0.47$	Do not reject H_o
44.	$p^* = 0.13...$	$z = 0.79$	Do not reject H_o
45.	$p^* = 0.36...$	$z = 0.57$	Do not reject H_o

46.	$p^* = 0.37...$	$z = 2.11$	Reject H_o
47.	$p^* = 0.30...$	$z = 2.67$	Reject H_o
48.	$p^* = 0.80...$	$z = 3.81$	Reject H_o
49.	$p^* = 0.09...$	$z = 0.00$	Do not reject H_o
50.	$p^* = 0.24...$	$z = 1.12$	Do not reject H_o

Note: Tests 3 and 6 could conclude rejection of H_o if the H_a is reversed - that is,

$$P_1 - P_2 < 0$$

which indicates a decrease in the proportions.

Post - n = 90

	x - Successes	Proportion = $\frac{x}{90}$
1.	24	0.27
2.	24	0.27
3.	49	0.54
4.	44	0.49
5.	77	0.86
6.	10	0.11
7.	54	0.60
8.	50	0.56
9.	79	0.88
10.	69	0.77
11.	77	0.86
12.	25	0.28
13.	16	0.18
14.	23	0.26
15.	73	0.81
16.	79	0.88
17.	32	0.36
18.	22	0.24
19.	10	0.11
20.	31	0.34
21.	16	0.18
22.	67	0.74
23.	73	0.81
24.	31	0.34
25.	47	0.52
26.	32	0.36
27.	27	0.30
28.	26	0.29
29.	24	0.27
30.	59	0.66
31.	22	0.24
32.	25	0.28
33.	19	0.21
34.	34	0.38
35.	34	0.38
36.	39	0.43
37.	49	0.54
38.	74	0.82
39.	56	0.62
40.	23	0.26
41.	50	0.56
42.	22	0.24

Pre - n = 97

	y - Successes	Proportion = $\frac{y}{97}$
1.	31	0.32
2.	19	0.20
3.	64	0.66
4.	40	0.41
5.	83	0.86
6.	22	0.23
7.	38	0.40
8.	26	0.27
9.	67	0.69
10.	57	0.59
11.	76	0.78
12.	29	0.30
13.	13	0.13
14.	9	0.09
15.	71	0.73
16.	73	0.75
17.	30	0.31
18.	20	0.21
19.	9	0.09
20.	33	0.34
21.	18	0.19
22.	65	0.67
23.	72	0.74
24.	18	0.19
25.	37	0.38
26.	31	0.32
27.	36	0.37
28.	29	0.30
29.	27	0.28
30.	53	0.55
31.	27	0.28
32.	32	0.33
33.	16	0.16
34.	29	0.30
35.	27	0.28
36.	40	0.41
37.	44	0.45
38.	71	0.73
39.	47	0.48
40.	26	0.27
41.	43	0.44
42.	11	0.11

43.	25	0.28
44.	14	0.16
45.	35	0.39
46.	41	0.46
47.	36	0.40
48.	83	0.92
49.	8	0.09
50.	25	0.28

43.	24	0.25
44.	12	0.12
45.	34	0.35
46.	30	0.31
47.	21	0.22
48.	68	0.70
49.	9	0.09
50.	20	0.21

ESL 3A PENPAL PROJECT, FALL SEMESTER 1991

COMMENTS TO OPEN-ENDED QUESTIONS:

ESL-PRO:

"I learned to write good letters"
"If you find a good penpal, you can make a friend."
"I learned how my penpal thought."
"I enjoyed exchanging opinions."
"She gave me many slang expressions."
"I learned to share ideas with a friend."
"It was interesting because you don't know the person you are writing to."
"I learned about Halloween, Thanksgiving and Santa Claus customs."
"We know more about interculture system and CRC."
"I learned about patience."
"We could express our feelings freely because we didn't know each other."
"My penpal always answered my questions."
"I liked it because there was no correction."

CONS:

"I didn't get to meet my penpal at the end."
"My penpal was a young man and was often boring. He only talked about football and his girlfriend."
"My penpal wrote very short letters. He was not responsible."
"I had three penpals. They kept dropping out."

ENL-PRO:

"It gives you a chance to meet someone you would not normally meed."
"It makes people feel welcome in school to have someone to write to."
"It is much more interesting than journals."
"It was interesting to see the problems people have with English and learn about barriers they face."
"I learned it was important to know grammar because we judge people on how well they can communicate."
"My penpal was very knowledgeable, friendly, and direct."
"I like the opportunity to mention stereotypes and ask questions in a non-confrontational way."
"It was refreshing. My penpal was very intelligent and curious."
"Just meeting someone different from anyone I know."
"I learned they have the same desires and needs I have."
"It gave me a different perspective on life in the United States. It made me grateful to be born here."
"If she could start fresh in such a different country, why couldn't I accomplish my goals?"

"It was different from the typical workload. It was relaxing."
"I learned that they really want to learn and must work very hard."
"I didn't realize how hard it is to learn English."
"It taught me how great life is here."
"It gave me ideas, and made writing easier for me."
"I learned how complicated American phrases or sayings are, how different their answer was from what I was really asking."
"I gained an appreciation for the struggles my penpal had in learning to fit into this society."
"Getting to know someone I would never have gotten to meet otherwise."
"It was personal and interesting to learn about the frustrations of being new in this country."

CONS:

Unanimous: a quicker exchange - weekly letters.
More organization.
Turn it into a grade so that you get more and better letters.
A better mailing system.
If felt forced and unnatural.
Don't write in class. Ten minutes isn't enough time. Choose reliable penpals.
Pair persons of the opposite sex; it presents a whole new perspective on roles of men and women.
Plan in advance so that everyone is involved and committed.

UNDERLINE THE SUBJECT ONCE; THE VERB TWICE

OR

GRAMMAR: WHAT GOOD IS IT?

LANGUAGE STUDY IN COMPOSITION COURSES

A RESEARCH PROJECT CONDUCTED BY
CYNTHIA CILENSEK KELLOGG
WOODLAND CAMPUS YUBA COLLEGE
FALL SEMESTER 1992

"You can't teach writing, but you can teach writers how to edit their own work."
--Nadine Gordimer

OVERVIEW

Introduction

A composition class at Woodland Campus Yuba College meets for a mere 48 hours. In that short time, the students are supposed to learn how to write passages which have "a complete, specific controlling idea; unified, focused, well-developed support; and a logical or analytical conclusion."

If they don't, they may not pass the department final exam. To help students achieve a level of writing proficiency to pass the final, Yuba College instructors follow a Language Arts Department course outline. It recommends two texts, one reader and one rhetoric, and is based on two principles of composition instruction: 1. writing-as-process and 2. reading professional authors as models for writing. In addition, most instructors, including myself, ask students to revise essays in collaborative learning groups.

The general course objectives and content, then, are established; however, the particular skills covered within this general pattern depend on individual instructors. Instructors must choose from the huge range of subjects traditionally included in the study of English such as grammar, vocabulary, spelling, mechanics, sentence types, sentence errors, paragraphing, punctuation, group discussion, reading strategies and more.

Each of these topics can be further divided into dozens of subtopics. Given the limited amount of time of each course, the instructor has to decide which skills to include; which to eliminate.

Grammar could certainly be eliminated. Each semester when I update my course syllabus, I consider eliminating it. I ask myself if the potential benefit of studying it warrants the time it takes; should I give up some of the 48 class hours to teach grammar, and if so how much time should I take? Should I insist that every student know and apply every principle or should I present principles for a limited amount of time and hope the most students possible retain and use them? Should I take time to teach the specific, subtle concepts such as the difference between a predicate adjective and a predicate nominative?

I have to confess that teaching grammar is very seductive. As a colleague of mine likes to say, "We teach what's teachable." Grammar is teachable. Unlike complex skills like writing or thinking, grammar acquisition can be measured with recitation or quizzes.

Following another truism in education, we teach what and how we were taught. I was taught grammar every year for 12 years and even in college in an English-for-English teachers course at UC Berkeley.

Within this context of wondering and doubting, I had the underlying question: what good is grammar instruction? Does it help students write better?

Background

As a graduate student at UC Berkeley, I was taught that students do not learn to write by studying grammar. Furthermore, some studies indicate that grammar instruction does nothing to improve the quality of student writing. As far back as 1903, Professor J.M. Rice demonstrated that when students studied grammar they did not write better. Commenting on Rice's work in 1986, a Professor Andrew Wilkerson of the University of East Anglia claimed that there was no point in further research on the subject.

So confirmed in this view was he that he compared further research on the benefit of grammar to further study on whether the earth revolves around the sun.

In Wilkerson's words, "No one believes in teaching grammar to improve written expression."

Yet many college level rhetoric books, designed specifically to teach composition, include a grammar section. Furthermore, my common sense and past experience have led me to conclude that when students learn grammar they become more conscious of their choices of in written expression they are able to edit their own work independently.

In addition, when I confer with individual students who have learned some grammar, I can use grammatical terms and concepts to explain sentence variety and sentence errors.

So each time I update a course I face this dilemma: do I follow the work of researchers such as Rice and Wilkerson, and drop all grammar study, or do I follow current college rhetorics and my own common sense and include grammar in instruction?

Purpose

The purpose of my research project was to decide if students write better compositions when they study grammar. My specific research question was this:

Does the study of grammar result in better compositions?

I defined grammar as the study of the following:

- definition parts of speech and parts of sentences;
- identification of and practice in writing types of sentences;
- study and practice of added sentence parts such as phrases;
- experimentation with sentence length and word order.

I defined better composition as one which evidenced some use of sentence variety and one which received a higher on a Departmental final (post-test) than on a pre-test.

I defined sentence variety as the use of sentences which vary from the usual subject- very sentence order and begin with a different type of word, phrase or clause.

Assumption

I assumed that by learning and applying grammar students would become conscious of choices in sentence patterns and that they would, therefore, include greater sentence variety in their compositions.

Sentence variety is one criterion on the Language Arts Department final composition scoring rubric (see attachment). In addition, when I analyzed the sentences of five authors in the English 1A text, The HBJ Reader, Eudora Welty, Langston Hughes, Barry Lopez, E.B. White, Isak Dinesen, and E.M. Forester, I discovered that those professional authors varied on the average of four of their sentences.

Thus, I assumed that the students would also write better compositions and receive higher scores if they studied grammar.

Literature

Bibliography

Hall, Janice K. Evaluating and Improving Written Expression. Allyn and Bacon, Inc. Boston. 1981.

Kennedy, X.L and Kennedy, Dorothy. The Bedford Guide for College Writers with Readings and Handbook. New York: St. Martins Press. 1990.

Loban, Walter. Teaching Language and Literature. New York: Harcourt, Brace, and World, 1961.

Newman, Judith M. Whole Language Theory in Use. London: Heineman Educational Books, Inc. 1985.

Nordquist, Richard. Passages. New York: St. Martins Press, 1990.

Wilkinson, Andrew. The Quality of Writing. Milton Keynes, England: Open University Press. 1986.

Zinsser, William. Writing to Learn. New York: Harper and Row, 1988.

METHODOLOGY

Design

Of my two sections of English 51, Basic Reading and Composition, I selected one as an experimental group and one as a control group by tossing a coin. The night section came up heads, experimental; the day section was, then, the control group.

In the first week of the semester, I administered a pre-test to both sections. I used the English 51 final from the spring semester as a pre-test. Based on the Language Arts Department 5-point rubric, I scored the tests anonymously, using social security numbers in the place of names as identification. I also scored each exam for sentence variety by counting the number of sentences which began with a construction other than the subject and verb. I counted the number of sentences which began with any of the following:

-a single word such as an adverb: **Suddenly, the door opened.**
-a phrase
    prepositional phrase: **In the room, I felt nervous.**
    participial phrase: **Running as fast as she could, she arrived first.**
    infinitive phrase: **To help, they came over early.**
-a clause: **After the team won, we celebrated at my house.**

In experimental group section, I taught a grammar/sentence structure unit lasting three weeks and covering 50 pages of the rhetoric Passages by Richard Nordquist (St. Martins, 1990).

Topics in grammar instruction:

1. terminology

    8 parts of speech
    participles
    infinitives
    gerunds

2. 3 parts of sentences

    subject, verb, complement
    phrases
    clauses

3. types of sentences

    simple
    compound
    complex

4. sentence combining

Following is an explanation of sentence combining and sample lesson from Passages.

> [Sentence Combining] will help you to create various kinds of clear and effective sentences. [It] allows us to cut out needless repetition and make clear connections between related ideas (Nordquist 238).
>
> Combine the sentences in each set by turning the underlined sentence (s) into an appositive:
>
> Pan was the pastoral god of fertility.
> Pan was depicted as a merry man.
> Pan was depicted as an ugly man.
> Pan was depicted as a man with a goat's horns, ears, and legs.
>
> Combination: Pan, the pastoral god of fertility, was depicted as a merry, ugly man with a goat's horns, ears, and legs (Nordquist 261).

Meanwhile, in the control group section, I taught vocabulary, word choice and spelling using the same rhetoric.

In both sections I administered a questionnaire at the end of the semester to determine their own assessment of how much they practiced sentence variety as a result of taking English 51.

Populations

English 51, Basic Reading and Composition, is the middle level composition course at Woodland Campus. It follows English 105, Pre-Collegiate Composition, and precedes English 1A, Freshman English. Students place in the course either by taking a placement exam or by passing English 105. In the fall semester of 1991, both the day and the evening sections included students of a wide range in ages.

Processing

I scored the pre-test, taking care to keep exams anonymous. I recorded all data on charts which I used to match up post-test scores.

Limitations

The holistic scoring and sentence variety counting provides an overview of what students may know, but it is not a refined method of telling how much of their knowledge is engaged. In other words, students may know points of grammar and may be able to use them in writing but won't necessarily use them on the final composition.

FINDINGS

Tables

1. Control group pre and post test scores
2. Experimental group pre and post test scores
3. Yuba College Language Arts Department English 51 scoring rubric
4. sample questionnaire
5. results

Findings

The data did not support the hypothesis. There was not sufficient evidence to conclude that the mean score of the experimental group on either the holistic score or the sentence variety count significantly improved over the mean score of the control group.

Nor did the student questionnaire reflect any significant difference in attitude or self-assessment between the two group.

But differences did occur. Both groups improved in writing ability according to holistic and sentence variety scores, and both improved in their own assessment of sentence variety use.

An additional difference was apparent: students in the experimental group made fewer sentence errors. In twelve compositions, students in the experimental group made only 4 run on or fragment errors altogether. Students in the control group made a total of 29.

Interpretations

Whereas the data did not support the hypothesis, it did indicate that the English 51 classes were successful. Students in both classes scored higher on post tests than on pre tests. The general course content, including writing as process, reading models and collaborative learning, worked.

Also the study of grammar evidently improved the students' ability to write correct sentences.

The question still remains as to how much grammar should be included in the course.

SUMMARY

The purpose of this research was to determine if a unit of grammar study resulted in writing improvement. If students learned basic terminology of grammar and practiced combining sentences, would they score higher on their holistically scored final and would they use more sentence variety? They did not.

They did, however, seem to write a greater number of correct sentences than those not studying grammar.

Conclusions

The results of the research were inconclusive.

Possibly the treatment was not strong enough. Possibly students need more time to study grammar before it showed up as making a consistent difference in their writing performance.

And possibly the results indicate that grammar could be omitted from composition courses with no loss to student writing ability.

Amusingly, for every conclusion English teachers arrive at, other English teachers arrive at the opposite. No sooner do we think we have an answer than a new answer comes to light. For example, college composition text books generally advise students to consider audience when they write essays. Yet respected teacher of teachers, Peter Elbow, advises students to ignore audience (Elbow, Peter. "Closing my Eyes as I Speak: An Argument for Ignoring Audience." X.J. Kennedy, Ed. Teaching with Readings for Writers 74).

Therefore, for me the question of whether to continue teaching grammar or not is still open.

Recommendations

I recommend that English instructors continue to question the value of grammar instruction and the amount of time they should to devote to it. One way to answer the question might be through informal classroom assessment techniques developed by Patricia Cross and Thomas Angelo.

This semester I have tried the Cross-Angelo "One Minute Paper," asking students to explain in a quick piece of writing how useful the day's grammar unit was. One student said, "Most useful part was how to play around with the words to embellish." To me the statement was an unsolicited testimonial to the benefit of grammar in developing sentence variety. Another student said the most useful knowledge presented in the class was the three types of sentences. The student explained, " I want to be able to write sentences in a way that they flow together," another testimonial to the benefit of grammar.

According to Walter Loban, grammar is the most useful when it is taught in relation to the students' work. Therefore, in teaching grammar this semester, I plan to work less with the text book and more with students' compositions. Through individual conferences using their own work, I will discuss the possibility of new constructions, and stress experimenting with varieties of ways to express ideas. I relied heavily on the text book for the research so that I would know exactly what I had covered with the experimental group.

Also in groups I will try sentence-building activities like assigning paragraphs and assign the task of coming up with new ways to develop the paragraphs.

Conclusions

Although the data did not disprove Andrew Wilkerson's contention that there is no point to further research to test the benefit of grammar study for writing, I will continue exploring the connection between grammar study and composition.

Not only do I think that grammar study can increase the choices students can make as they write, but I also think there are other benefits to students' mastering grammar. For one, it helps teacher-student communication. We can use grammatical terms to point out possible revisions. For another, common sense tells me that if students know principles grammar, including sentence patterns, they are more likely to be edit and revise their own work independently both during the course and once they complete it.

I would like to add that communication in language so complicated that we don't know all the components of good writing, all the skills and mental processing that one uses to write. Maybe in our research projects we haven't asked all the right questions, made all the right connections yet or come to the right conclusions.

When I told a friend about Wilkerson's research proving that grammar study does not improve writing he told me the joke about the scientist and the flea.

A scientist tells a flea to jump. It jumps. The scientist then pulls off two legs and tells it to jump. It jumps. He then pulls off all its legs and tells it to jump. It does not jump. "Ah, ha!" says the scientist. "This proves that pulling off a fleas legs destroys its hearing."

Doing this research project has helped me focus on an important issue in my teaching. Because of my focus on grammar, I have begun to develop new ways to present and assess it. Above all, the project has convinced me that continuing to engage in classroom research keeps us in contact with the actual effect of our efforts on the students.

Will I still ask students to underline the subject once; the verb twice? Probably. I will definitely keep asking.

Test 1. Holistic Scores

$H_o: \mu_1 - \mu_2 = 0$ There is no difference in the means in the improvement of holistic scores.

$H_a: \mu_1 - \mu_2 = 0$ There is a greater difference in the mean improvement of the experimental group.

Use $\alpha = 0.05$

With $n_1 + n_2 - 2 = 12 + 14 - 2 = 24$, use the t - distribution with 24 degrees of freedom. Thus $t_c = 1.711$.

The test statistic will be

$$T = \frac{\overline{X} - \overline{Y}}{\sqrt{\frac{S_x^2}{n_1} + \frac{S_y^2}{n_2}}}$$

If $t > 1.711$, then reject H_o.

With $\overline{x} = -0.67$, $s_x = 0.492$, $n_1 = 12$, $\overline{y} = 0.46$, $s_y = 0.720$, and $n_2 = 14$:

$$t = \frac{-0.67 - 0.46}{\sqrt{\frac{0.492^2}{12} + \frac{0.720^2}{14}}} = -4.725$$

Because $-4.725 < 1.711$, do not reject H_o. There is not sufficient evidence to conclude that the experimental group did significantly better than the control group in improving holistic scores. In fact, reversing the population in H_o and H_a would lead one to conclude that the mean of the control group significantly improved over the mean of the experimental group.

Table 1

Classroom Research — Experimental Group
Cynthia Kellogg
Yuba College

Pre and post test holistic scores and pre and post test sentence variety total.

		holistic			variety		
		pre	post	d	pre	post	d
6009	Susan	3	3	0	3	6	3
5352	Muhammed	3	2	-1	0	16	16
3062	Helen	4	3	-1	2	12	10
6435	Trudy	3	3	0	2	7	5
3339	Debra	4	3	-1	0	2	2
0341	Amanda	3	3	0	4	10	6
8485	Peggy	4	3	-1	4	10	6
1030	Jose	3	3	0	1	3	2
3236	Angie	3	2	-1	2	5	3
3856	Julia	3	2	-1	1	4	3
7117	Cristina	3	2	-1	2	2	0
8128	Fermin	3	2	-1	0	4	4
	n = 12			$\Sigma d = -8$			$\Sigma d = 60$
				$\bar{d} = -0.67$			$\bar{d} = 5.0$
				$s_d = 0.492$			$s_d = 4.31$

Call the scores from experimental group x.
The means of each set of data are then $\bar{x}$.
The standard deviation of each set of data are then s_x.
The population mean is then μ_1.

Test 2. Sentence variety scores

$H_o: \mu_1 - \mu_2 = 0$	There is no difference in the means of sentence variety scores.
$H_a: \mu_1 - \mu_2 > 0$	There is a greater difference in the mean improvement of experimental group.
Use $\alpha = 0.05$	Again, as in Test 1, use $t_c = 1.711$.

The test statistic will be

$$T = \frac{\overline{X} - \overline{Y}}{\sqrt{\frac{S^2_x}{n_1} + \frac{S^2_y}{n_2}}}$$

If $t > 1.711$, then reject H_o.

With $x = 5.0$, $s_x = 4.31$, $n_1 = 12$, $y = 3.4$, $s_y = 3.46$, and $n_2 = 14$:

$$t = \frac{5.0 - 3.4}{\sqrt{\frac{4.31^2}{12} + \frac{3.46^2}{14}}} = 1.032$$

Because $1.032 < 1.711$, do not reject H_o. There is not sufficient evidence, with $\alpha = 0.05$, to conclude that the mean score of the experimental group in sentence variety significantly improved over the mean score of the control group.

Comparing results on questionnaire and evaluation:

For each test : $H_o: \mu_1 - \mu_2 = 0$

$H_a: \mu_1 - \mu_2 > 0$

$\alpha = 0.05$ and $t_c = 1.699$

Response 1. $t = -1.138$ Conclusion: No difference

Response 2. $t = 0.321$ Conclusion: No difference

Response 3. $t = -0.954$ Conclusion: No difference

Comparing Responses 1 and 2 combining both classes:

$H_o: \mu_d = 0$ No difference in results of students attitudes.

$H_a: \mu_d > 0$ English 51 improved students attitudes.

Comparing 2 versus 1: $t = 14.879$

$\bar{u} = 2.09$, $s_u = 0.805$, $n = 33$

Conclusion: A very significant improvement.

Comparing 3 versus 1: $t = 11.976$

$\bar{u} = 1.88$, $s_u = 0.874$, $n = 31$

Conclusion: A very significant improvement.

Table 2

Classroom Research Control Group
Cynthia Kellogg
Yuba College In each case: d = post score - pre score

Pre and post test holistic scores and pre and post test sentence variety totals.

		holistic			variety		
		pre	post	d	pre	post	d
6009	Mauricio	2	2	0	1	4	3
1550	Dulce	3	4/3	0.5	0	5	5
0079	Susana	3	3	0	0	13	13
2002	Cynthia	3	5	2	2	2	0
1022	Craig	3	3	0	0	7	7
4878	Jennifer	3	3	0	5	6	1
9676	Marc	3	3	0	2	5	3
1459	Tamitha	3	3	0	2	5	3
2983	Cindy	3	3	0	0	2	2
1312	Tanya	2	4	2	1	5	4
9357	Linda	3	4/3	0.5	1	1	0
6127	Marcie	4	4	0	0	2	2
5653	Cheri	4	5	1	1	1	0
9408	Julia	3	4/3	0.5	2	7	5
n = 14				Σ d = 6.5			Σ d=48.0
				$\bar{d} = 0.46$			$\bar{d} = 3.4$
				$S_d = 0.720$			$S_d = 3.46$

Call the scores from the control group y.
The means of each set of data are then $\bar{y}$.
The standard deviation of each set of data are then S_y.
The population mean is then μ_2.

Table 3

ENGLISH 51 SCORING RUBRIC
WOODLAND CAMPUS, YUBA COLLEGE

5 An excellent essay that thoughtfully analyzes the reading passage and responds insightfully to the topic.

- the analysis is supported with well - chosen examples and persuasive reasoning.
- the thesis clearly addresses the reading passage and provides focus for the student response
- the organization is clear, logical, and effective
- paragraphs are highly unified and coherent with good transitions
- sentences are sophisticated and varied
- diction is effective

4 --A competent essay that clearly analyzes the reading passage and responds appropriately to the topic

- the analysis demonstrates understanding of the text and sensible reasoning
- the thesis addresses the reading passage topic and provides focus for the student response
- the organization is evident, with some minor lapses in logic or weak transitions
- paragraphs have a topic sentence and are mostly coherent
- sentences are easily understandable, though not highly stylistic
- word choice is competent

3 --An adequate essay that satisfactorily discusses the reading passage though it will depend primarily on narration instead of analysis

- the analysis is brief, weak, or trivial
- the thesis is evident, yet it may be too broad or non-specific
- organization is apparent, yet it may be formulaic (5-paragraph essay)
- paragraphs contain a topic sentence, but may ramble and be somewhat confusing
- sentences might be short, choppy or lack control
- word choice is largely correct, though dull

2 --An inadequate essay that does not communicate clearly, lacks analysis, and is a seriously deficient response.

- analysis is lacking, perhaps non-existent
- the thesis is unclear or there may be several
- organization is not readily apparent to the reader
- paragraphs are underdeveloped, illogical, or merely a catalogue of unrelated sentences
- sentences are simple, with surface errors thatinterfere with understanding
- word choice will be simple or inappropriate

1 --An essay that suggests severe difficulties in reading and writing conventional English

- disregards topic or reading text altogether
- thesis is not identifiable
- organization and/or development is very poor or insufficient
- paragraphing, sentences, and word choice are incoherent
- serious and persistent errors

English 51L
Questionnaire

Class hour____

Circle the response you think best characterizes your writing.

1. Before I took English 51, I tried to use sentence variety when I wrote.

sometimes often usually

2. As a result of English 51, I try to make my essays flow smoothly.

sometimes often usually

3. Because of English 51, I try to use sentence variety when I write.

sometimes often usually

4. Because of English 51, I try to use sentence variety when I revise essays.

sometimes often usually

5. After taking English 51, I notice the sentences of other authors.

sometimes often usually

6. After taking English 51, I notice when other authors use sentence variety.

sometimes often usually

Appendix B

TEST OF WRITTEN ENGLISH (TWE)
SCORING GUIDE

REVISED 2/90

Readers will assign scores based on the following scoring guide. Though examinees are asked to write on a specific topic, parts of the topic may be treated by implication. Readers should focus on what the examinee does well.

Scores

6 **Demonstrates clear competence in writing on both the rhetorical and syntactic levels, though it may have occasional errors.**

A paper in this category
- effectively addresses the writing task
- is well organized and well developed
- uses clearly appropriate details to support a thesis or illustrate ideas
- displays consistent facility in the use of language
- demonstrates syntactic variety and appropriate word choice

5 **Demonstrates competence in writing on both the rhetorical and syntactic levels, though it will probably have occasional errors.**

A paper in this category
- may address some parts of the task more effectively than others
- is generally well organized and developed
- uses details to support a thesis or illustrate an idea
- displays facility in the use of language
- demonstrates some syntactic variety and range of vocabulary

4 **Demonstrates minimal competence in writing on both the rhetorical and syntactic levels.**

A paper in this category
- addresses the writing topic adequately but may slight parts of the task
- is adequately organized and developed
- uses some details to support a thesis or illustrate an idea
- demonstrates adequate but possibly inconsistent facility with syntax and usage
- may contain some errors that occasionally obscure meaning

3 **Demonstrates some developing competence in writing, but it remains flawed on either the rhetorical or syntactic level, or both.**

A paper in this category may reveal one or more of the following weaknesses:
- inadequate organization or development
- inappropriate or insufficient details to support or illustrate generalizations
- a noticeably inappropriate choice of words or word forms
- an accumulation of errors in sentence structure and/or usage

2 **Suggests incompetence in writing.**

A paper in this category is seriously flawed by one or more of the following weaknesses:
- serious disorganization or underdevelopment
- little or no detail, or irrelevant specifics
- serious and frequent errors in sentence structure or usage
- serious problems with focus

1 **Demonstrates incompetence in writing.**

A paper in this category
- may be incoherent
- may be undeveloped
- may contain severe and persistent writing errors

Papers that reject the assignment or fail to address the question must be given to the Table Leader.
Papers that exhibit absolutely no response at all must also be given to the Table Leader.

107.5

ETS Copyright © 1986, 1990 by Educational Testing Service. All rights reserved.

Used with permission

ASSIGNED TOPICS VS. STUDENT TOPICS:
FOR DEVELOPING FLUENCY IN ESL STUDENTS
UNDER TIMED-WRITING CONDITIONS

A RESEARCH PROJECT CONDUCTED BY
CHARLES F. HONNOLD
HUMANITIES DIVISION
AMERICAN RIVER COLLEGE
FALL SEMESTER 1991

OVERVIEW

Introduction/Background

Students learning English as a second language (ESL) are often coming from a learning environment where grammatical correctness was emphasized. In some countries, such as Japan and Korea, students are taught through the grammar-translation method, and often the teachers themselves can barely speak English. Students from this type of learning environment usually feel they have to translate their ideas from their native language. Unfortunately, this often leads to using English words with native language grammatical structure, which can cause breakdowns in communication.

Ways are needed to try to "break" students of translating from their native language and of their focusing on correctness as opposed to communication. Speedwriting is a technique which may be able to increase ESL students' fluency in English. Students will do a 5-minute timed writing and then count the number of words that they are able to write, recording the number of words written in five minutes on a graph. Since the emphasis is on speed, not on grammatical correctness, sstudents should be able to begin developing fluency over the course of a semester.

Problem

Too often students want to focus on correctness, worrying over every word before they write. They are never able to develop a flow to their writing because they are stopping too often to self-correct. When they have timed, in-class essays, some students are unable to write much because they cannot get going, since in worrying about correct forms, they minimize content. By stressing fluency over correctnesss, students can begin to write more competently.

While at first the concept of speed over grammar is foreign to students, to become good writers they need to be able to get their ideas down on paper before they can begin to work on organization. They need to begin revising on a global scale, before focusing on correctness. Corrections should be made in the final phase of the writing process--editing.

Purpose

This study proposes that students will benefit from speedwriting because they will have to race to get their ideas down as quickly as possible without mulling over grammar, spelling, or other less crucial editing problems. Once students have their ideas down then they will have something to work with. In previous classes, students have made dramatic improvement in their fluency through speedwriting, and being able to see this improvement on their graphs inspires them even further.

It is the purpose of this study to exam speedwriting, determining if there is a difference between writing on topics of the teacher's choice or writing on topics of their own choice. Their writing on in-class essays will also be investigated to see if there is a difference on assigned or free choice topics in length and quality

Assumption

In writing classes, I operate under the assumption that the more students write, the better they will become. Speedwriting is a device to get students to try to write more, so that they have something to work with. But more words does not necessarily make better writing, and once I get students to have sentences to work with, then I have them work on sentence combining to improve their writing. I introduce coherence devices, and my hope is that they will develop writing that clearly carries their message. Speedwriting is merely one step in a total process.

Scope

This project was extremely limited in scope, since there was only one semester in which to accomplish the research, and I was teaching classes at four of our five different levels of ESLwithout having two sections of any of the classes.

METHODOLOGY

Population

For this research project I used my ESL 3 A class, which met at 11 am, Monday, Tuesday, Wednesday, and Friday. This is the middle level writing course in our 5 level ESL program. At the beginning there were 23 students from 12 different countries: Vietnam--5; Iran--3; Japan--3; Korea--2; Laos--2; Philippines--2; and one student each from Hong Kong, Mexico, Malaysia, the Soviet Union, Spain, and Taiwan. They spoke 11 different native languages: Vietnamese--5, Cantonese--3; Farsi--3; Japanese--3; Korean--2, Spanish--2; Tagolog--2; and one each of Hmong, Lao, and Russian. There were 17 students who took both the pre-and posttests, and 21 who wrote both experimental essays.

Instruments

The essays in this project were all scored holistically using the scoring guide developed by the Educational Testing Service (ETS) for the TOEFL TWE (Test of English as a Foreign Language--Test of Written English) and was used with the permission of ETS. I have participated in the scoring of the TOEFL TWE for more than three years and have been trained as a table leader. The scores range from 1 to 6, with 6 being the highest. (See Appendix B.)

Procedure

Near the end of the first class session I introduced the concept of speedwriting. I explained to the students that this was to help them develop fluency in writing English and that I was not interested in their spelling or grammar. I told them to write as fast as they could without pausing or going back to make corrections, that I only wanted to see how many words they could write in a five-minute period.

It is necessary to explain to students that correctness will be dealt with in another part of the course, that in speedwriting fluency is the goal. Initially some students are resistant to the idea of speed over correctness. They have to be reassured that "errors" will be dealt with separately, but that before students can worry about grammatical correctness they need to have some ideas down on paper to work with.

When students understand the underlying concept, we begin the actual task. Students label their paper with the date, the speedwriting number and the title of the speedwriting. At the beginning of the semester I assigned all of the speedwriting topics. Later I alternated, with students having free choice on some and my choice on others. Several times during the semester I had them write both my choice and their choice speedwritings on the same day, starting class with one type and ending class with the other, and alternating which type was given first and which was given last.

At the beginning of the semester for the pretest, students wrote for 30 minutes on an assigned topic. Those essays were not returned to the students, and at the end of the semester they were given the same topic to write on as a posttest. I scored the essays using the TOEFL TWE scoring guide and I counted the number of words on each essay. In the middle of the semester the midterm essay, also on an assigned topic, was scored and the number of words counted. At the end of the 14th week students wrote a 30 minute essay on anything of their choice, while at the beginning of the 15th week they wrote a 30-minute essay on an assigned topic.

Collection

The speedwritings and the charts on which students kept track of their progress were collected twice during the semester, in the 9th week and in the 17th week. Students counted their own words after a training session in which they were given guidelines to follow. I did not re-count any of their speedwritings, hoping that they had all maintained consistency.

Limitation

While students had a sheet explaining the counting of words on the speedwriting, they did the counting themselves. In spite of instructions, not all students counted uniformly. I can only hope that they were consistent over time. Occasionally students would come in late, while the speedwriting was under way, distracting people around them. Thus, the speedwriting data cannot be completely trusted.

On the five essays included in the research, I counted the number of words on each myself, so those figures are consistent and accurate. However, on reflection, I wish that I had scored the pre- and post-tests at the same time, mixing them together randomly. Since I scored them several months apart, while the scores are consistent per set, I probably was not as consistent across sets as I could have been if I had scored them at the same time.

The entire project would have been stronger if I had been able to compare to classes at the same level, using one as the experimental group and one as the control group. When our ESL program grows enough so that we actually offer two sections of the same class in the daytime, I will attempt to redesign this project so that I can actually compare a class with speedwriting to one without.

FINDINGS

Factual information

There were seventeen students who took both the pretest in the first week and the posttest in the 16th week. The average score was 3.059 on the pretest and 3.824 on the posttest. The average number of words written in the 30 minutes was 193.82 on the pretest and 253.52 on the posttest.

When twenty-one students wrote on their own choice of topics at the end of the 13th week they wrote an average of 254.95 words, while on the assigned topic at the beginning of the 14th week, they wrote an average of 219.95 words.

There was no significant difference in speedwritings whether the choice was mine or theirs.

Interestingly, Student # 6, who wrote the most on the pretest, 469 words, wrote far less, 363 words, on the posttest. She received a higher score, however, which shows that more is not always better. She was able to use the sentence combing techniques to improve her writing.

Interpretation

Clearly, something that was being done in class led to better writing, both in length of essays and in their scores. Students did write more specific details and use more sentence variety. The speedwriting data are muddled as the topic caused widespread variations, and students didn't write particularly more on topics of their own on speedwriting.

Students did write more on essays in which they chose the topic. Their scores were similar to those on the essay the following class when I chose the topic. Thus, there is no reason for teachers not to allow students to write an in-class essay on their own choice of topic from time to time, just to allow greater student investment in the writing.

SUMMARY

Conclusions

On their essays, students did write significantly more at the end of the semester than they did at the beginning. However, whether this was due to speedwriting or just to the overwhelming amount of writing that I have students do cannot be ascertained. Students' writing, as evaluated by the TOEFL TWE scoring guide, did improve over the semester, but students are supposed to improve, so once again I cannot ascertain that that was due to speedwriting.

On unannounced 30-minute, in-class essays on consecutive days, students did write substantially more when they were writing an essay on their own choice of topic than when writing on an assigned topic, although the scores were not significantly better. Thus, there does not seem to be any reason to preclude having students make their own choice on the topic sometimes.

Recommendations

In the future when I replicate this research, I will mix the pre- and post-test essays and score them at the same time. Also it would be better to conduct a norming session using student essays written on the same topic in previous years and have two other readers who have been trained by ETS with the TOEFL TWE scoring guide rate the essays independently. This would ensure that there is no unconscious bias. Furthermore, to actually measure whether speedwriting has an effect on students' writing, it will be necessary to have two sections of the same class and do speedwriting in one but not in the other.

Research Faculty Comments

While I have informally been carrying out classroom research thoroughout my teaching career, this is the first time I have undertaken a formal project such as this. My project continued to evolve, taking different directions when I discovered that I could not do some of the things that I intended to. I have learned from my mistakes and feel it was an extremely valuable process.

I am indebted to Dick Rasor, Gene Sellers, and Kirk Wiecking for their help and encouragement in this project, especially at times when I was floundering trying to redesign my project as I went.

It was a valuable experience which allowed me to discover that there are noticeable differences in student writing depending on whether the topic is teacher chosen or student generated, and to redesign my courses to allow for this. I only wish there were release time available to pursue this.

TABLE 1 -- ESSAY SCORES

Pretest	8/20/91	Best/worst teacher
Midterm	10/18/91	Learning enjoyable
Free choice	11/15/91	Student's own choice
Teacher's choice	11/18/91	Invention/discovery
Post-test	11/27/91	Best/worst teacher

Student #	**Pre**	Mid	Free	Teach	**Post**
1	3	3	4	3	3
2	3	3	--	3	--
3	4	--	4	3	4
4	2	2	3	2	3
5	3	3	4	4	4
6	4	5	5	5	5
7	3	3	4	--	--
8	--	4	4	4	4
9	3	3	3	3	4
12	3	3	4	3	4
13	3	4	3	3	4
14	3	4	3	4	4
15	2	3	3	3	--
16	3	3	4	4	--
17	3	4	4	4	4
18	3	3	4	OT*	3
19	3	3	4	3	4
20	3	3	3	3	3
21	3	3	4	4	4
22	3	3	4	3	4
23	3	3	3	3	3
24	3	OT*	4	3	--
26	3	4	4	4	5

*OT = off topic (did not write on the assigned topic)

TABLE 2 -- ESSAYS --NUMBER OF WORDS WRITTEN IN 30 MINUTES

Pretest	8/20/91
Midterm	10/18/91
Free choice	11/15/91
Teacher's choice	11/18/91
Post-test	11/27/91

Student #	Pre	Mid	Free	Teach	Post
1	180	253	227	291	279
2	184	288	--	179	--
3	145	--	291	218	220
4	94	95	120	82	118
5	220	235	353	244	311
6	469	273	322	323	363
7	214	231	153	--	--
8	--	269	326	223	307
9	187	365	392	311	379
12	76	84	215	119	198
13	229	257	127	47	241
14	183	217	152	203	249
15	163	249	398	217	--
16	240	274	149	216	--
17	247	230	255	246	236
18	138	163	233	239--OT*	277
19	302	168	180	144	183
20	196	209	323	339	337
21	116	247	319	209	210
22	197	82	249	174	219
23	133	152	132	152	205
24	109	178 OT*	375	393	--
26	183	280	224	229	285

*OT = off topic (did not write on the assigned topic)

TABLE 3 -- SPEEDWRITING

8/19/21 -- Speedwriting #1
10/14/91--Speedwriting #20
Paired
11/6/91-- #4 freechoice
#5 teacher's choice ("My revising process)
11/13/91 #6 teacher's choice ("How to write a good essay")
#7 free choice

Student #	#1	#20	#4	#5	#6	#7
1	143	102	89	82	107	103
2	76	60	50	57	58	80
3	78	104	130	87	93	100
4	--	99	90	95	90	101
5	89	84	96	106	136	118
6	176	211	--	189	--	203
7	88	146	132	114	135	139
8	49	84	113	83	80	111
9	112	133	115	127	139	120
12	54	62	58	80	60	73
13	103	163	151	156	101	144
14	66	101	63	104	93	93
15	38	70	--	--	--	--
16	118	102	120	127	153	103
17	180	120	116	100	100	100
18	69	85	75	83	63	75
19	86	105	114	124	100	100
20	127	141	94	107	101	104
21	102	133	136	120	135	130
22	80	64	55	60	50	45
23	90	100	93	84	105	100
24	119	145	137	143	131	132
26	68	80	66	76	80	66

Appendix A--Sample essays

Student Number 12

Pre-test

Every student have memories about the teachers who teachs them during the time they study even they graduated

Most of teachers are always in my mind. They are very cheerful. They teach us with their heart. History teacher is one of my favourit teacher because I like study history. He is funny, not strict. He always smiles in class. After school I and my friend came to his office to ask for his help. He

76 words *Score --3*

Post-test

In Vietnam, most of the teachers are respected because they represent the parents to educate us. However, some of them some times can not be respected from the students because they treat bad to the students. Such as in my case: I think that the worst teacher who could not receive the respect from me, was my math teacher.

My math teacher was the worst one that I have had in my life. He was the same as the other Math teachers, but only one thing that made him became worst to me, even some my classmates was he wanted us to study in his home after our school. He didn't directly tell us about his propose, but every times he corrected our exams, he always gave us a low grade. He explained that I and some of my friend did wrong or did difference way of his teaching. One day, after he turned back our math exams, he told me that I had to come to his office after the class. At his office, he told me if I wanted to improve my grade, I would study in his house and I had to pay for his teaching.

198 words *Score--4*

Student Number 26

Pre-test

When I was highschool students, I've met a really good English teacher who was very powerful, confidence, funny. The reason why do I remember him even now is that he was the only one who teach us real English. Several English teachers whom I learned from junior high to highschool was kind of egg heads. They've even never been to the United States and learned real English. They always used to said to us, "Remember only this answer." If they've never been to the United States. How do they teach us English? I always had a question like this. Well, on the other hand, my favorit English teacher that I described before had many experienced. He teached us not only his living in the United States, but also very small accent that its really hard to learn for us. Whenever he teached us in his school, he told me about his friends or where did he trips. Among his story, when he talked about gay's street in San Francisco, we're surprised. Like this, his way of teaching English was

183 words ***Score--3***

Post-test

All through my educational period, I always had terrible teachers. They were just pretending as a teacher so I really could not get along with teachers. However, when I was a sophmore in highschool age, I met an excellent English teacher that I had never met before. His name was Murata who studied English to improve his English skills in California. Although he was about forty-five year old English teacher when he studied abroad, he had many interesting experiences in the United States. Therefore, I learned real English from him. His way of teaching English was greater than any other English teachers that I had.

When I took his class and saw him, I thought he was simply the usual English teacher. After he started to talk about his career, I was getting indulged his conversation because not only was his English pronunciation greatest, but also his conversation was unusual. I remember we were always laughing because he suddenly sang a Christmas song in the class instead of doing lecture. Sometimes he talked about the gays of San Francisco that we had never heard before. Besides these chats, he especially taught us English pronunciation. For instance, the difference of "a" sounds. When we could not pronounce properly, he used to let us pronounce the same words ten times in the class. Moreover, he was the one who could explain about the difference of grammatical use. The final exam which he made us was really difficult. It was rare to get more than eighty percent. However, as long as I was listening to his lecture in the class, I had learned real English, and I liked that class.

I'm sure he is still teaching English in my highschool.

285 words ***Score--5***

Test 1. Comparing teacher post (No. 5) and teacher pre (No.1)

Data: $\bar{d} = 59.7$

$S_d = 82.75$

$n = 17$

H_0: $\mu_d = 0$ No difference between post and pre.

H_a: $\mu_d > 0$ A positive increase.

Use $\alpha = 0.05$

The test statistic will be:

$$T = \frac{\bar{D}\sqrt{n}}{S_d}$$

If $t > t_c$ (=1.746), then reject H_0.

With $\bar{d} = 59.7$, $s_d = 82.75$, and $n = 17$:

$$t = \frac{59.7\ \sqrt{17}}{82.75} = 2.975$$

Because $2.975 > 1.746$, reject H_0 and accept H_a.

That is, a positive increase between tests.

Test 2. Comparing free choice (#3) and teacher choice (#4).

Data: $\bar{d} = 24.5$

$S_d = 70.74$

$n = 21$

$H_0 : \mu_d = 0$

$H_a : \mu_d > 0$

Use $\alpha = 0.05$

The test statistic will be:

$$T = \frac{\bar{D}\sqrt{n}}{S_d}$$

If $t > t_c$ (=1.725), then reject H_0.

With $\bar{d} = 24.5$, $s_d = 70.74$, and $n = 21$:

$$t = \frac{24.5\sqrt{21}}{70.74} = 1.587$$

Because $1.587 < 1.725$, do not reject H_0.

Cannot accept the hypothesis that free choice yields better scores.

Test 3. Comparing speedwriting teacher choice and free choice

Data $\overline{d} = 0.59$

$S_d = 14.243$

$n = 22$

$H_O : \mu_d = 0$ No difference in results from two choices.

$H_a : \mu_d > 0$ Speedwriting based on free choice is greater than speedwriting based on teacher choice.

Use $\alpha = 0.05$

The test statistic will be

$$T = \frac{\overline{D}\sqrt{n}}{S_d}$$

If $t > t_c$ (=1.721), then reject H_o.

With $\overline{d} = 0.59$, $s_d = 14.243$, and $n = 22$:

$$T = \frac{0.59\sqrt{22}}{14.243} = 0.194$$

Because $0.194 < 1.721$, do not reject H_o. There is not sufficient evidence to conclude that speedwriting increases when students are given free choice of topics versus teacher assigned topics.

COMPUTER SKILLS IN THE FASHION INDUSTRY
A COMPARISON OF THE ATTRIBUTES OF COMMUNITY COLLEGE STUDENTS AND THE NEEDS OF EMPLOYERS

A RESEARCH PROJECT CONDUCTED BY
PEGGY GORBACH
FASHION MERCHANDISING DEPARTMENT
SOLANO COMMUNITY COLLEGE
FALL SEMESTER 1991

OVERVIEW

Introduction

Since Fashion Merchandising and Fashion Design are vocational curricula at the California community college level, it is imperative that students graduate with the necessary skills to be employed in the fashion industry.

Technological advancements brought on by the Industrial Revolution in the eighteenth century transformed the garment industry from one relying on hand tailoring to one dominated by ready-to-wear items. The fashion industry is being revolutionized again, this time by advancements in computer technology. Apparel manufacturers and retailers are surging ahead with technological advances in computer-aided design (CAD), computer-aided manufacturing (CAM), sales and inventory management and Quick Response. Curricula at the community college level must keep abreast with this increasingly computerized industry in order for students and graduates to be qualified for current and future jobs.

CAD and CAM have significantly reduced the time it takes for manufacturers to sketch a design and produce a line of garments. With these systems a manufacturer can grade the pattern, make a marker and reduce production time, enabling the manufacturer to remain competitive in the changing world market.

Retailers also use CAD in visual merchandising and store planning and computers are an important part of the inventory control and merchandising. Quick Response is the computerized link between the producer of the raw materials, the manufacturer and the retailer. It is used in the American apparel industry as a way for a design to be produced and goods delivered with a shorter lead time which allows retailers to place orders closer to the time of consumer purchase; thus improving fashion forecasting timeliness and retailers' open-to-buy (funds available for inventory).

Purpose

The purpose of this research was to investigate the needs of large retailers and apparel manufacturers in the San Francisco Bay Area for computer skills in Fashion Merchandising and Fashion Design graduates, and to compare such needs with the educational training received by current students and recent graduates. With these facts it is the author's intention to develop a curriculum that will match students' education with employers' needs.

METHODOLOGY

Populations

Data were collected from 41 students in the first week of October of the Fall 1991 semester at Solano Community College, located approximately 40 miles Northeast of San Francisco in Suisun, California. Students surveyed were enrolled in Fashion Merchandising 53, an introductory course that investigates the fashion business or Visual Merchandising 54, a course that studies the visual presentation of merchandise and enables the students to work with displays. Also surveyed were members of the Fashion Club, a group of Fashion Merchandising and Fashion Design students that meets twice a month at Solano Community College. Students who were involved in more than one of these groups were surveyed only once.

Data were also collected from 4 major retailers in the Bay Area and from 10 large manufacturers taken from the Largest Bay Area Apparel Manufacturers from the San Francisco Business Times dated May 17, 1991. Questionnaires were given to the retailers and manufacturers either over the phone or in personal interviews with the author.

Instrumentation

The instruments used to collect data were student and employer questionnaires developed by the author (see Appendices 1 and 2). Research was conducted by administering an anonymous questionnaire, the response to which would enable the author to determine the students level of expertise on computers and to determine how much more training they believed necessary to reach their personal career goals.

The questionnaire for students consisted of statements on how often they used computers, where they received computer training, how much they felt they would use computers in their future careers, how much training they would need to reach their career goal and what courses they would like the fashion department to offer. Students were asked to circle the responses that best represented their feelings regarding each statement.

The employers were surveyed on the number of employees they hire a year, percent of recent graduates, positions hired for, important traits necessary for job, computer experience, computer programs and confidence level required. Employers were asked to provide their best response to each statement.

TABLE 1
DEMOGRAPHIC CHARACTERISTICS OF STUDENTS

Characteristic	Frequency	Percent
Age		
18	6	14.6%
19	3	7.3%
20	7	17.0%
21	4	9.8%
22	1	2.4%
23	2	5.0%
25	1	2.4%
27	2	5.0%
28	2	5.0%
29	2	5.0%
30	1	2.4%
32	1	2.4%
33	1	2.4%
35	3	7.3%
38	1	2.4%
41	1	2.4%
53	1	2.4%
55	1	2.4%
65	1	2.4%
	n=41	100 %
Mean Age	26.878	
Median Age	22	
Gender		
Male	4	10%
Female	37	90%
	n=41	100%
Major		
Fashion Merchandising	19	46%
Fashion Design	14	34%
Undeclared	4	10%
Other	4	10%
	n=41	100%

FINDINGS

Description of Respondents

Of the 41 students at Solano Community College, 10% were male and 90% were female; 46% were Fashion Merchandising students, 34% were Fashion Design students, 10% were undeclared majors and 10% were other majors. The age range of these students were from 18-65 with the mean age of 27 and the median age 22. Of these students surveyed, 37% were currently employed in the fashion industry, 26% were previously employed and 37% have never been employed in the fashion industry. 47% of the students had completed 0-10 units in college course work making them first year students.

Each of the large retailers in the Bay Area that responded to the survey hired more than 101 employees a year, mostly for Management Training Positions. Of the large manufacturers surveyed, 40% hired 51-100 employees per year and 40% hired 101 or more per year for various positions including Merchandise Assistant and Design Assistant.

Surveyed Students

Currently, 37% of the students at Solano College rarely use computers for personal reasons such as letters or writing reports. Students are trained on their present computer skills in the business and education departments at the college; however, it has become increasingly difficult to get enrolled in these courses as enrollment in the college increases. 55% of those students currently holding jobs did not use computers on the job.

58% of the students surveyed felt that computers would be used in their future careers and 68% felt they would need a great deal more training to be prepared for their imminent jobs. Over half of the students surveyed felt that they needed computer classes such as an Introduction to Computers and Computer-Aided Design for Apparel.

Surveyed Employers

Employers from large retail stores felt that previous experience and leadership skills were highly important for prospective employees. Communication skills and a degree from college were important for 75% of those surveyed. Coordination skills, organizational skills, extra curricular activities, math and writing skills were also highly important. One retail person stated that in order to compete in the industry an employee must be able to do simple math such as percentages and fractions in his or her head.

The retailers felt that little computer experience was necessary to be hired; the employer would train the employee on their own system. Nevertheless, they felt that some type of word processing was helpful and indicated that most applicants are hired with this skill.

Each of the large manufacturers cited previous experience as the most important factor for prospective employees and leadership skills as the next most desirable. The manufacturers stated that any other skill such as pattern-making and sketching that might be required depended on the position.

When the manufacturers of the Bay Area were surveyed on computer usage, the most important factor cited was that the employee must be "computer literate". Since basic knowledge can easily be transferred to other systems, the employers typically required familiarity with basic PC software such as MS-DOS and word processing. Nevertheless, each manufacturer stated that the company trains new employees to operate the computer programs necessary to do the job that they were hired to do.

Each of the manufacturers surveyed need employees that can operate some type of Computer-Aided Design, or Computer-Aided Manufacturing system; however, they do not require the new employees to be proficient with CAD and CAM programs because the manufacturers train new employees to use their own respective systems.

SUMMARY

The author conducted research on forty-one (41) fashion students at Solano Community College to determine their computer skill level. Research was also done on four (4) large retailers and ten (10) large manufacturers in the San Francisco Bay Area to ascertain their needs of newly hired employees on computer skills as well as any other significant skills.

Computerization is advancing forward in the fashion industry, employers in retail and manufacturing are looking towards the colleges and universities to aid them in training employees on available systems. Curricula must include these courses and advance the student towards their future career. In today's economy, retailers and manufacturers are competing in a global market, and to remain competitive one must keep up with technological advances in the field.

Research indicated a need for computer courses to be taught at the community college level. Graduates of fashion programs need to be familiar with word processing and CAD to serve the industry today.

Conclusions

The fact the 58% of the students felt they would use computers in their future career goals and 68% stated they will need a great deal more training to be prepared for their future profession implies that the colleges must supply the courses to properly educate the future fashion professionals.

Previous experience, leadership skills, communication skills, degree, coordination skills, organizational skills, extra curricular activities, math and writing skills are all important to the retailer and are required skills for the prospective employee. Computer skills were not considered to be as important; however most applicants are hired with some proficiency and or experience with computers. Therefore, if is imperative that students who plan on a career in retail have the necessary computer skills to compete with other applicants.

Previous experience and leadership skills are the most important traits manufacturers of the Bay Area cited in the research. While retailers did not place a great deal of emphasis on the computer skills of job applicants, manufacturers felt that computer skills are very important. They felt that an applicant must be familiar with at least the basics of computer systems to become adaptable and easily taught the employers' respective systems.

Manufacturers can profit from a student's knowledge of computers. Technology in the U.S. apparel industry is advancing to remain competitive with imported goods, knowledge of all or any aspect of computers will be valuable to both the manufacturer and the graduate. Computer courses are available on all campuses along with CAD courses; these courses can focus on the apparel industry to aid in the students expertise.

Implications

The U.S. apparel industry is fighting the influx of imports from other countries. One way for this industry to remain competitive is through advanced technology. The industry is looking to the colleges and universities for training in this specialized field and we as instructors must supply the needed curricula. Graduates will profit from this knowledge and supply the industry with the competitive edge to meet the demands of employers.

Students can be prepared for careers in the industry with the proper education and training. It is vital to consider the needs of both students and employers when modifying and updating curricula so that they meet the demands of the appropriate industry.

Recommendations

Since the computer knowledge and proficiency is becoming more and more essential in the fashion industry, courses should be designed to meet these needs. Since employers require previous experience it would benefit students and employers to develop and implement internship and/or work experience programs with the employers in the Bay Area. Due to the increasing demand for computer courses at colleges and universities, students are finding it more and more difficult to enroll. To resolve this problem, it may become necessary to create fashion-related computer courses in the fashion department to better serve the students and focus on the industry needs. Required courses and recommended electives should reflect the results of this study and be implemented to better serve the needs of fashion students and the industry.

RESEARCH FACULTY COMMENTS

Because of the growing value and importance of computer skills and sparked by the author's research and interest in the subject, students have become increasingly aware of the needs of the industry for graduates with proficiency with computers. Students now recognize the need to excel at these skills in order to be able to compete in the industry and increase their marketability as they start working toward their future career goals.

APPENDIX 1
COMPUTER QUESTIONNAIRE FOR STUDENTS

Please circle the response that best represents your feelings regarding each of the following questions:

1. How often do you use a computer?

   Never Rarely Occasionally Regularly Always

2. Where have you received computer training?

   High School College Technical School Employer(s) Self-taught

3. What was the source of your present computer skills?

   Science/Math Business Textiles/Clothing Interiors Education Other

4. Currently, in your present job, how much do you use computers?

   Never Rarely Occasionally Regularly Always

5. How often do you feel you would use computers in your future career?

   Never Rarely Occasionally Regularly Always

6. How much more training will you need to be properly prepared for your career goals?

   None Little Moderate A great deal

7. What computer courses would you like to be offered by this department?

   Intro to DOS Intro to Computers Use of Software CAD for Apparel/Other

8. What is your work experience in the fashion industry?

   Currently employed Previously employed Never employed

9. What is your major?

   Fashion Design Fashion Merchandising Undeclared Other____________

10. How many college units have you completed?______________________________

11. Age______

12. Male______ Female_____

Thank you for taking the time to complete this questionnaire; your answers are appreciated.

APPENDIX 2
COMPUTER QUESTIONNAIRE FOR EMPLOYERS

1. How many new employees does your company hire a year?

   0-20 21-50 51-100 101-or more

2. What percent of hires have graduated from college or junior college? (within the last 6 months)

   10% 20% 30% 40% 50%
   60% 70% 80% 90% 100%

3. What kind of positions do you hire them for?

4. Which of the following traits are important for the prospective employee? (choose one or more)

   Previous Experience Coordination Skills Organizational Skills

   Communication Skills Leadership Skills Degree

5. How much computer experience is necessary for the job?

   None Little Moderate A great deal

6. Of the following programs available on computers, check the one(s) you would like employees to be familiar with:

   DOS PC Software (ie. WordPerfect and Lotus 1-2-3)
   CAD Other:________________________

7. For those computer programs checked, to what level of confidence do you require?

   None Little Moderate A great deal

8. Your company's type of business:

   Retail Manufacturer Other:______________

9. Name of Business:____

10. Contact:____

Thank you for taking the time to complete this questionnaire; your answers are appreciated.

AN INITIAL INVESTIGATION INTO WHY MORE AFRICAN-AMERICAN STUDENTS DO NOT TAKE FOREIGN LANGUAGE CLASSES

A RESEARCH PROJECT CONDUCTED BY
DR. RAMIRO CANTO-LUGO
LANGUAGE ARTS DIVISION
AND
MATTHEW J. REICH, M.A.
YUBA COMMUNITY COLLEGE
FALL SEMESTER, 1991

OVERVIEW

Introduction

The 1990 U.S. Census report tells us that by the year 2000 ethnic-minorities will represent more than 51% of the American populations. The majority of this ethnic population is made up of African, Asian, and Latin-Americans. However, while a significant number of Asian and Latin-Americans are bi-lingual, African-Americans, like most European-Americans, are solely dependent upon English as their only channel of everyday communication. With the growing population of bi-lingual Americans and also with the growing significance of the international community on the American economy it has become increasingly apparent that all Americans should know at least one other language besides English in order to be competitive in the world market.

Since the 1960's American colleges and universities have been engaged in the ongoing question of how to best educate women and minorities (Davis, 1991). Many campuses have experienced a measure of greater diversity. Yet many of these students feel that they are treated as unwelcomed outsiders (Cones, Noonan and Janha, 1983). Statistics at Yuba College show that even when confronted with an overwhelmingly diverse student population, a majority of African-American students still do not enroll in foreign language classes. This refusal to interact and learn about each other's culture defeats the purpose of actively seeking out a diverse student population and will not serve or prepare students for our future population and economy. In spite of the need for foreign languages both at home and abroad foreign languages seem to have a lower priority in the curriculum of many two year institutions. This paper will try to focus specifically on the issue of why African-Americans are not taking foreign languages.

Currently, the literature is absent of any research on African-Americans and foreign languages. To date a myriad of studies (too numerous to list here) focus on African-Americans and mainstream English. With the lack of any empirical information or long-term research programs in this study we chose to use a standard questionnaire to ascertain student ideas as to why there seems to be a lack of interest in foreign languages among African-American students. This approach allowed us, as ethnographers, to begin to understand the students world vision so that we might be able to develop hypothesis to be later tested.

METHODOLOGY

The study involved eighty-seven students all of African-American descent. It was conducted on the three Yuba College campuses and the two educational centers. Each group met in a classroom environment on five different occasions. In the initial meeting each group was given a questionnaire to determine the interest in foreign languages. The responses from these questionnaires where utilized to interview students and document their responses in the remaining four meetings. The questionnaire contained four specific items relating to foreign languages:

1. Are you required or have you been advised to take a second language here at Yuba College?
2. Do you foresee any need for a second language other than English in your future occupation?
3. Do you feel that your education has prepared you to learn a second language?
4. Do you think that foreign languages should be a requirement for graduation?

RESULTS

Part 1 Questionnaire

Q1: 19.5% (17) percent of the students were advised to take a foreign language. Specifically, 15 of those students were advised to take Spanish and 2 students were advised to take Japanese. The other 80.5% (70) were not advised to take any foreign language at all.

Q2: 21% (18) replied that taking a foreign language would not be advantageous in their future occupation. Nevertheless, an overwhelming 79% (69) students felt that a foreign language would enhance their employment opportunities.

Q3: 63% (55) of the students did not feel their education prepared them to learn a foreign language. 18%(16) believed they were academically prepared to learn a foreign language. Another 18% (16) did not respond.

Q4: 64% (56) of the students would not require a foreign language for graduation from a two year college. The remaining 36% (31) responded yes that learning a foreign language should be required for graduation.

Part II Interview

The statements listed below are representative of some of the most significant comments made by the students during the group interview sessions:

1. "I have never been advised to take a foreign language."
2. "My English is not good enough to learn a foreign language."
3. "When I took French in my senior year of high school I found that the teacher was hostile towards my accent. Since then I don't really care for foreign languages."
4. "Although I know I need a foreign language I don't have the time to take classes five days a week."
5. "Our language is English, so I don't see why I should have to learn another language."
6. "I definitely think that if I knew Spanish it would be easier for me to get a job after graduation."
7. "I would like to take Japanese or some other really interesting language, but they don't offer it here."

CONCLUSION

Based on the data collected above we implemented an introspective analysis which produced four major areas which affect whether or not a student chooses to take a foreign language: (1) Lack of Information, (2) Time Commitment, (3) Cultural/Political Ideology, and (4) Past Experiences.

It was obvious to us that the majority of students were poorly informed of the availability of the foreign languages curriculum. Even though foreign languages are listed in the college catalogue as well as in the schedule the students seemed to be unaware of which foreign language would benefit them in their future endeavors. Furthermore, many of the students thought that a foreign language course would not transfer to or would not fulfill the G.E.D. requirement at a four year college or university.

Many of the students who were informed about the foreign language curriculum and who even knew what language they would benefit from still found it difficult to include it in their schedule. Another small group of students exhibited strong hostility towards studying any other language besides English. Finally, several students suggested that their self-esteem had been lowered due to constant criticism by foreign language teachers in high school. Others simply stated that even after two or three years of French or Spanish in high school they still were not proficient.

The literature on why more students do not take foreign languages is sparse. With regards to African-American students specifically the literature is silent. In this study we too did not seek to answer that question but instead to begin a dialogue on the issue and to encourage future research programs to address these questions.

REFERENCES

Cones, J.H. Noonan, J.F. and Janha, D. (eds). Teaching Minority Students. New Directions for teaching and Learning no.16 San Francisco: Jossey-Bass, 1983.

Davis, B.G. Tools for Teaching. In Press, 1991.

"DOES THE GRAPHING CALCULATOR ENHANCE LEARNING IN PRECALCULUS?"

A RESEARCH PROJECT CONDUCTED BY
KATHERINE MCLAIN
SCIENCE AND MATH DIVISION
COSUMNES RIVER COLLEGE
FALL SEMESTER 1991

OVERVIEW

The technology of the 90's presents major challenges and opportunities for mathematics educators. The mathematics community needs to carefully explore how our curriculum and methodology will change in response to these very accessible tools. Much experimentation needs to be undertaken and many assumptions must be challenged if our students will receive the full educational benefits this new technology can provide. However, serious and careful research needs to be done about the effects of this experimentation.

I have used the graphing calculator in precalculus for two years. I believe that its inclusion is valid educationally and it has seemed to me that the graphing calculator has made a qualitative difference in the course. The use of the graphing calculator promotes student interest, gives the opportunity for discovery learning in precalculus and gives a certain credibility to the course since non routine problems can be included. It is my feeling that the use of the graphing calculator enables educators to access some of the higher level goals of the course. I also believe that the existence of the graphing calculator challenges some of the basic assumptions which have undergirded our current undergraduate mathematics curriculum.

The purpose of this project, however, is not to investigate these perceptions. That is the topic of another project. The purpose of this project is merely to investigate whether the inclusion of the graphing calculator in precalculus helps the students to meet the standard objectives of the first unit of study in a standard precalculus course. This unit traditionally is a review of algebraic manipulations and equation solving. My study involves researching whether the incorporation of the graphing calculator enhances student learning in this unit.

METHODOLOGY

This study has attempted to determine if the inclusion of the graphing calculator into the first unit of study is more effective than a non-calculator based curriculum. This was accomplished by comparing Unit One test scores of two precalculus classes. One class was chosen at random to receive a graphing calculator supplement (this class will be referred to as the experimental group), and the other class did not receive the supplement (this group will be referred to as the control group). Both classes had the same teacher, the same syllabus and the same textbook (a non-calculator based textbook). Both classes received the same modes of instruction: the lectures were the same and group activities were designed for the control group to compensate for the graphing calculator material which involves group activities. An example from a lab activity for both groups is included in Appendix 1. Daily homework activities for the two groups included identical assignments from the textbook plus instructions to complete the lab activities which were started during the class period.

A pretest was given during the first day of instruction to establish the comparability of the two groups. This pretest was a multiple choice test which tested the student's knowledge of the material in the first unit. This was graded with no partial credit, and then the raw scores were converted to percentages. The data from the pretest is given in Table 1. A twosample t-test using Minitab was run using the data, and t=1.01 confirmed that the two classes were statistically equivalent.

Table 1

Control Group	Experimental Group	
Pretest scores	Pretest Scores	
32	73	50
45	32	68
68	45	54
23	50	59
41	45	54
50	41	45
59	54	36
82	59	36
45	41	77
23	36	50
45	59	32
45	68	32
36	41	32
41	45	
32	54	
45	41	
41	50	

FINDINGS

At the end of the first unit of study both classes were given the same Unit One test. This was graded (for the purposes of this study) with no partial credit. The scores for the two classes (given in percentages) are included in Table 2 below. A two sample t-test using Minitab revealed that the t score comparing the achievement of each class was $t=1.02$. This t score indicated that the graphing calculator supplement did not significantly improve learning.

Table 2

Control Group	Experimental Group	
Unit One Test Scores	Unit One Test Scores	
63	70	90
70	72	79
69	78	77
66	56	94
71	75	67
74	72	83
82	72	65
66	86	51
61	41	68
34	89	34
64	53	55
32	81	35
50	72	31
46	52	
72	60	
74	78	
59	62	

A second calculation was then performed, including only students in the experimental and control group who had completed at least 50% of their lab write ups. It should be noted that since the non-calculator labs were less extensive than the calculator labs, no one in the control group was excluded from this modified group. The Pretest and Unit One test scores of the modified groups is given in Table 3. The two sample t-score for the pretest comparison of control and experimental groups was $t=1.26$ which established that the two groups were statistically still equivalent. The two sample t-score for the Unit One test was $t=1.93$. Since this t score exceeds the critical value of 1.65, this implies that students who completed at least 50% of the graphing calculator labs did statistically better on the first unit test than students who did not have calculator based assignments.

TABLE 3

CONTROL GROUP

Pretest Scores	Unit One Scores
32	63
68	70
23	69
41	66
50	71
59	74
82	82
45	66
23	61
45	34
45	64
36	32
41	50
32	46
45	72
41	74
45	59

EXPERIMENTAL GROUP

Pretest Scores		Unit One Scores	
73	50	70	77
32	54	72	94
45	45	78	67
45	36	56	83
41	36	75	65
54	77	72	51
59	50	72	68
41	32	86	55
36		41	
59		89	
68		53	
50		81	
68		72	
45		52	
54		60	
54		90	
41		79	

SUMMARY

My project was designed to investigate whether the inclusion of the graphing calculator into Precalculus would enhance learning during the first unit. The data collected on the entire control and experimental group did not suggest a statistically significant difference between the two groups. While this is discouraging in part, the results are actually somewhat encouraging. One objection to the use of the graphing calculator has been the fear that its use would weaken the student's algebraic skills. This study suggests that this is not the case. Since the objectives of Unit One were entirely algebraic and non graphical in nature -- the statistically equivalent performance by both groups shows that the graphing calculator can be used without damaging students' algebraic skills.

The statistics on the modified control and experimental groups (where students not turning in 50% of the lab summaries were excluded) does suggest that amongst this group, the graphing calculator exercises which supported the objectives of Unit One did enhance learning. While this is encouraging, this result must be tempered by the fact that some other variable might have accounted for this statistical variation. It is important to note that the homework scores for non lab activities on Unit One of those eliminated from the experimental group were 45%, 45%, 65%, 90% and 90%. This suggests that I did not just eliminate the unmotivated students by eliminating the students who did not turn in their lab summaries.

It should also be noted that this research occurred during a semester when I changed the way that the graphing calculator was incorporated into the precalculus course. In the past I have used a graphing calculator based textbook. During this semester, however, I used a traditional textbook and wrote labs and homework exercises to incorporate the calculator. The implementation of these labs was difficult, and I initially encountered much student resistance to the graphing calculator. This was eventually overcome in the middle of Chapter 3, however, and by the end of the course I was contacted by the speech teacher at Cosumnes who told me that during the week she had heard 12 speeches by my students on the merits of the graphing calculator! The difficult initial implementation, coupled with the length of time it takes students to get used to a new medium may have made data collected at the beginning of the semester somewhat invalid. Unfortunately I can not use any data from later in the semester because I began using the graphing calculator for demonstration purposes in the control group.

The last comment I would like to make is that these results challenge the intuitive way we as teachers measure the effectiveness of a class session. On the basis of the usual qualitative measures teachers make of a class (quality of questions, intensity of discussion, classroom atmosphere etc.) the group of students which excelled was the control group! The fact that this class as a group did not outperform the other class is curious. Perhaps these qualitative measures are not really as significant to true learning as current research might indicate -- or perhaps my data which weakly supported the value of the graphing calculator is more significant than the mere numbers suggest.

Appendix 1

Sample questions from Lab #3

Control Group

1) Evaluate $(x^2-2x-3) / (x^2-9)$ for the following x values:
   a) $x=1$

   b) $x=-2$

   c) $x= 3$

2) Reduce $(x^2-2x-3) / (x^2-9)$

3) Evaluate the reduced version of $(x^2-2x-3) / (x^2-9)$ for the following x values:
   a) $x=1$

   b) $x=-2$

   c) $x=3$

4) Is the expression $(x^2-2x-3) / (x^2-9)$ really equivalent to $(x+1) / (x+3)$?
   Why or why not?

Experimental Group

1) Sketch the graph of $y=(x^2-2x-3) / (x^2-9)$ for $-10 \leq x \leq 10$, $-10 \leq y \leq 10$. Record the graph below.

2) Sketch the graph of $y = (x^2-2x-3) / (x^2-9)$ for $2.9 \leq x \leq 3.1$ $-1 \leq y \leq 3$. Record the graph below.

3) Reduce $(x^2-2x-3) / (x^2-9)$.

4) Graph the reduced version of $(x^2-2x-3) / (x^2-9)$ for $-10 \leq x \leq 10$ and $-10 \leq y \leq 10$. Record the graph below.

5) Graph the reduced version of $(x^2-2x-3) / (x^2-9)$ for $2.9 \leq x \leq 3.1$ $-1 \leq y \leq 3$. Record the graph below.

6) Compare the above graphs. Is $(x^2-2x-3) / (x^2-9)$ really equivalent to $(x+1)/(x+3)$?
   Why or why not?

LABORATORY ACTIVITIES
IN
DEVELOPMENTAL MATHEMATICS

A RESEARCH PROJECT CONDUCTED BY
KENT M. NEUERBURG
COSUMNES RIVER COLLEGE
FALL SEMESTER 1991

OVERVIEW

Beginning in the early 1980's, a wave of reform in mathematics education began. There was a strong emphasis on ensuring that the students understood the concept rather than simply memorized a solution method. Also at this time many new pedagogical ideas began to wend their way into the mainstream of secondary and post-secondary mathematics education; for example, graphing technology, manipulatives (long the staple of elementary school teachers), and group work to name a few. Teachers began to explore ways of using these materials to enhance mathematical concept development. In 1982, the California State Department of Education set the tone of the reform in its Handbook for Planning an Effective Mathematics Program:

> "In a high quality mathematics program, the teacher
> sets the stage for students to explore, discover,
> and learn mathematical concepts in meaningful ways."

While much of the reform has been aimed at the K-12 schools, its impact has certainly been felt at the Community College level. All of the national mathematics education organizations have supported the reform movement, including the National Council of Teachers of Mathematics, American Mathematics Association of Two Year Colleges, and the Mathematical Association of America. In response, many community colleges have introduced new methodologies. For example, using graphing technology in their college algebra (and higher) courses or teaching the new "lean and lively" calculus. However, Developmental Mathematics programs were often left untouched.

The traditional method for teaching mathematics has been that of lecture--teachers are the dispensers of knowledge, students are the passive recipients of that knowledge. In the community colleges, Developmental Mathematics courses (Arithmetic and Prealgebra) are often taught in this same manner. In particular, at Cosumnes River College, the Arithmetic course has traditionally been taught using a five lecture hours per week format. However, a serious problem existed in the Developmental Mathematics program at Cosumnes River College. We consider success to be completion of the course with a grade of "C" or better and many students were not being successful. Business and industry has a rule of thumb that says only 15% of a problem is people and 85% of the problem is process. It seems reasonable that we begin to look at the process of education in our classes. This project was designed to measure the impact of such a process change on the success of the students.

METHODOLOGY

We have changed the format of the Arithmetic class from five hours lecture to three hours lecture and three hours laboratory per week. The question becomes, "Does the inclusion of laboratory activities improve student success?" I am defining "laboratory activity" to include manipulative activities, group projects, discussions, and problem solving sessions. The goal of these labs was to get the students actively involved in the process of doing and discussing mathematics.

The concept of the experiment was to change the instructional format of the Arithmetic course and look at the effect on student performance. (In order to limit the scope of the experiment, I collected data only on the unit in which fractions were taught.)

As a control group, I used three sections of Arithmetic that I taught in the traditional manner over the last two semesters. The treatment group consisted of one section of Arithmetic that I am teaching this semester using laboratory assignments. I used the same set of (secured) tests in all four sections. The students' Chapter 1 test (basic whole number arithmetic) was used to create an initial comparison between the control and treatment groups. The Chapter 3 test (fractions) was used to measure the difference between the two groups after treatment. Here "treatment" refers to the inclusion of laboratory activities.

THE EXPERIMENT

The course was designed to have three hours lecture and three hours laboratory each week. The lecture met twice a week for 1.5 hours each, while the lab meet three times a week for 1 hour each.

All of the lab activities were intentionally done in cooperative groups. I hoped that the students would question, explain, and discuss the mathematics that they were investigating and this was indeed what happened. In fact, the students became quite verbal during the labs as they discovered that learning was not something that need be done in a vacuum.

In the labs used during this study, students were provided manipulatives to aid them in developing the concepts necessary in the arithmetic of fractions. In fact, students discovered many of the standard algorithms by utilizing the manipulatives in conjunction with group discussions. The following activities were the assigned laboratories.

Lab 1: Using Cuissenaire Rods to convert improper fractions to mixed numbers
Lab 2: Using Cuissenaire Rods to convert mixed numbers to improper fractions
Lab 3: Practice with proper fraction, improper fractions, and mixed numbers
Lab 4: Multiplying fractions. Pt. I--Areas, Pt. II--Conversion of Units
Lab 5: Review Sheet
Lab 6: Using Cuissenaire Rods to convert between equivalent fractions

Lab 7: Using Cuissenaire Rods to Find Least Common Denominators
Lab 8: Using Cuissenaire Rods to Add Mixed Numbers
Lab 9: Using Cuissenaire Rods to Subtract Mixed Numbers
Lab 10: Review Sheet.

The new lab format allowed the students repeat exposure to each topic in that the students had the opportunity to work with a concept in the lab, hear about it in the lecture, and discuss it again after the homework assignment was completed. Compared with the traditional lecture method where a topic is discussed only once, there was much greater exposure for each topic.

FINDINGS

The control group and treatment groups were compared on two different tests. The first given shortly after the beginning of the semester, the second given approximately half-way through the semester. The results of these assessments are shown below.

CONTROL		TREATMENT	
Chap 1	Chap 3	Chap 1	Chap 3
$\bar{x}_1 = 90.47$	$\bar{x}_1 = 82.39$	$\bar{x}_2 = 90.15$	$\bar{x}_2 = 89.17$
$s_1 = 7.18$	$s_1 = 13.77$	$s_2 = 8.18$	$s_2 = 7.88$
$n = 57$		$n = 20$	

Note the similarity between the groups on the chapter 1 test. To establish equity between the groups, we use a z-test with a level of significance of 0.05. Despite the relatively small size of the treatment group, I felt it was large enough to use a z-test. We start by establishing the following hypotheses:

H_0: $\mu_1 - \mu_2 = 0$ (There is no difference in the population means.)
H_a: $\mu_1 - \mu_2 \neq 0$ (There is a difference in the population means.)

We compute the test statistic based on the Chapter 1 results:

$$Z = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\dfrac{S_1^2}{n_1} + \dfrac{S_2^2}{n_2}}}.$$

Where $\bar{x}_1$ is the mean of the control group,
$\bar{x}_2$ is the mean of the treatment group,
s_1 is the standard deviation of the treatment group,
s_2 is the standard deviation of the control group,
n_1 is the sample size of the treatment group, and
n_2 is the sample size of the control group.

Here $z = -0.16$. At a 0.05 level of significance the cut-off z scores for rejecting H_0 and accepting H_a are -1.96 and 1.96. Since $-0.16 > -1.96$ and $-0.16 < 1.96$ we accept H_0, thereby establishing that the two groups were essentially equivalent in abilities at the beginning of their respective courses.

Next, we want to compare the population means, μ_1 and μ_2, on the Chapter 3 exams. We establish the following hypotheses:

H_o: $\mu_1 - \mu_2 = 0$ (The treatment makes no difference in student performance.)
H_a: $\mu_1 - \mu_2 > 0$ (The treatment improves student performance.)

(Recall that "treatment" refers to the inclusion of laboratory activities.) For this test, a 5% level of significance will also be used. This means if $z > 1.65$, then reject H_o, and if $z < 1.65$, then do not reject H_o. Again, the test statistic is determined by

$$Z = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}.$$

Where $\bar{x}_1$ is the mean of the treatment group,
$\bar{x}_2$ is the mean of the control group,
s_1 is the standard deviation of the treatment group,
s_2 is the standard deviation of the control group,
n_1 is the sample size of the treatment group, and
n_2 is the sample size of the control group.

In this case, we find $z = 2.67$, meaning that we reject H_o and accept H_a. In fact, this z-score implies significance at the 1% level.

SUMMARY

The inclusion of the laboratory activities in the developmental courses seems to have a significant impact on student success. The students in the treatment group explored concepts and developed their own mental constructs of these concepts, rather than relying on a few memorized algorithms. The result--the students in the treatment group scored higher on their exams than students in the control group.

CONCLUSIONS

Given the statistical significance of the difference in student performance, I am firmly convinced of the value of lab activities in the Developmental Mathematics curriculum. The labs allowed the students the opportunity to apply the power of the scientific method--to conjecture, test, and explain--to their study of mathematics. The labs require students to think about mathematical concepts, not just algorithms. The labs require students to use the language of mathematics to communicate their ideas to their peers. In short, the labs are an effective way to get students to become active, successful participants in their education.

ON GOING SEMESTER USE OF THE
DUNHAM DANCE TECHNIQUE
TO IMPROVE STUDENT PREPAREDNESS FOR DANCE

A RESEARCH PROJECT CONDUCTED BY
SHIRLEY BROWN
PHYSICAL EDUCATION DIVISION
SACRAMENTO CITY COLLEGE
FALL SEMESTER 1991

OVERVIEW

Description

The purpose of this project is to show how I've incorporated the Dunham Barre Technique as a basic dance form for the beginning jazz dance classes. Also the performance of one class which meets three days a week compared to the other dance class which meets two times a week.

The Dunham Barre Technique was derived from dances of African and Haitian descent. This technique has similarities to jazz dance style of movements. The technique will be taught and practiced for an entire semester. The students will also be graded twice on it, however, the dance patterns will be the main source of evaluation of how effective the Dunham technique is.

There are ten different movements geared toward warming the body up and strengthening the arms and legs. The following Dunham Barre Technique will be taught:

1. Pushing body in and out
2. Waist bends
3. Drop and recover
4. Leg extensions
5. Lunges
6. Leg swings side to side
7. Second position plies
8. Leg swings forward and back
9. Second position foot relives
10. Jump lunges.

From this type of technique, students will gain more flexibility, agility and coordination. The Dunham Barre Technique has proven to be more beneficial than a regular off the barre floor technique. With my two beginning jazz dance classes, I will teach the Dunham Barre Technique for the entire semester. However, both classes will also learn the same dance pattern (routine) which will further illustrate the effectiveness of the Dunham Barre Technique.

METHODOLOGY

Procedure

During the Fall semester 1991, the Monday, Wednesday, Friday class, along with the Tuesday, Thursday class learned the Dunham Technique and practiced it for the entire semester. Both classes also learned a dance pattern (routine) which was to further determine the validity of the Dunham Technique.

Both classes were taught the following twelve barre technique movements.

1. Pushing body in and out - Standing arms length from the barre with feet shoulder length apart, holding onto the barre, the student pushes the body forward and back while bending arms when going forward and keeping the feet flat on the floor.

2. Waist bends - Standing with the feet in medium second position while holding onto the barre with arms straight, the student bends over to the waist keeping the back flat and spreading the hands further apart as she bends forward and hands come back to original position as student raises up.

3. Drop and Recover - Starting in medium second position, facing the barre arms distance, student starts bent over to the waist with a flat back, arms are straight while hands are holding onto the barre. Student releases hands from the barre while dropping body down, so the chest goes toward the thighs and the back is slightly rounded. From there, student raises body back up and returns to starting position.

4. Leg Extensions - Standing in a modern first position with back to the bar, holding on. Lift leg up to waist bent on first four counts, toes are pointed. On 5, straighten leg out, on 6 flex foot, on 7 and 8, lower leg down to the floor. Repeat, two sets on each leg.

5. Lunges - Facing the bar standing in a modern first, extend the right foot back with heel off the floor. Every time opposite knee bends, the heel touches the floor. student does seven on one side with transition on eight, ready to do on the other side.

6. Leg Swings Side to Side - Standing in a modern first with back to bar and holding on to it. Lift the right leg up bent across standing leg and toes pointed, bring leg down and flex foot when it touches the floor. Repeat same movement as leg goes out to the side. Do sequence four times on each side.

7. Second Position Plies - Facing the bar with feet in second position and holding onto the bar. Bend the knees for four counts, lift right heel and bend for four counts. Repeat on left side, then lift both heels off floor at the same time while bending knees. Repeat entire sequence from the beginning several times.

8. Leg Swings Forward and Back - Facing bar with feet in a modern first and hold onto bar arms length. Lift leg up bent forward bring leg down as you flex foot. Lift leg back as you bend it. Repeat four sets on each leg. Standing leg remains straight.

9. Second Position Foot Releves - Facing the bar with feet in second position and holding onto the bar. Lift right heel up four times, repeat on left side, then do both heels together four times.

10. Jump Lunges - Standing in first position away from bar, with back to bar and arms to side. Jump with right foot going back as left foot goes forward. Every time you land the leg in front will be bent. Jump 7 times, turn on the count of eight. Repeat.

Students in both classes learned five dance patterns during the semester but were evaluated on the last one for this project. Everyone was broken up into groups of six, seven or eight and were given ample time to practice with each other.

The dance pattern had isolative and three different locomotor movements. Everyone danced to a medium tempo popular style jazz music. Both dance classes were videotaped in groups of six or eight. They all presented the same dance pattern. The composition and production dance class evaluated both dance classes, however, they did not know one class from another because the tapes were mixed up. There were a total of six tapes. Three from each class. The evaluators were given the following form:

EVALUATION FORM FOR DANCE PROJECT

0 1 2 3 4 5 6 7 8 9
Poor Average Good

1. Rhythm - Was the student group dancing to the beat of the music or against it?

   0 1 2 3 4 5 6 7 8 9

2. Coordination/Transitions - Was the student group moving from one series of movements to the next correctly?

   0 1 2 3 4 5 6 7 8 9

3. Showmanship and Stage Presence - Was the student group projecting?

   0 1 2 3 4 5 6 7 8 9

4. Proper execution of the dance routine to the best of student's ability - Were arms, legs, feet, and body moving properly in the correct formations?

   0 1 2 3 4 5 6 7 8 9

FINDINGS

For the following calculations:

Population I - MWF Jazz Dance Classes

μ_1 is the population mean, $\overline{X}$ is the sample mean, S_1 is the sample standard deviation, and N_1 is the sample size.

1. Rhythm

$\overline{X}$ = 6.93
S_1 = 1.285
N_1 = 30

2. Coordination/Transitions

$\overline{X}$ = 6.47
S_1 = 1.332
N_1 = 30

3. Showmanship and Stage Presence

$\overline{X}$ = 6.54
S_1 = 1.358
N_1 = 30

4. Proper Execution . . .

$\overline{X}$ = 6.60
S_1 = 1.303
N_1 = 30

FINDINGS CONTINUED

Population II - TT Jazz Dance Classes

μ_2 is the population mean, $\overline{Y}$ is the sample mean, S_2 is the sample standard deviation, and N_2 is the sample size.

1. Rhythm

$\overline{Y} = 5.74$
$S_2 = 0.806$
$N_2 = 19$

2. Coordination/Transitions

$\overline{Y} = 5.79$
$S_2 = 2.839$
$N_2 = 19$

3. Showmanship and Stage Presence

$\overline{Y} = 5.21$
$S_2 = 0.631$
$N_2 = 19$

4. Proper Execution . . .

$\overline{Y} = 5.21$
$S_2 = 0.918$
$N_2 = 19$

RHYTHM COMPONENT OF DANCE PROJECT #1

$H_o : \mu_1 - \mu_2 = 0$	This is no difference between the mean scores of Population 1 versus Population 2.
$H_a : \mu_1 - \mu_2 > 0$	This mean score of Population 1 is greater then the mean score of Population 2.

The level of significance of the test is $\alpha = 0.05$.

The test statistic used will be

$$Z = \frac{\overline{X} - \overline{Y}}{\sqrt{\frac{S^2_1}{n_1} + \frac{S^2_2}{n_2}}}$$

With $\alpha = 0.05$ and a directional test, $z_c = 1.65$

If $z > z_c$ $(=1.65)$, then reject H_o.

With $\overline{x} = 6.93$, $s_1 = 1.285$, $n_1 = 30$, $\overline{y} = 5.74$, $s_2 = 0.806$. and $n_2 = 19$:

$$z = \frac{6.93 - 5.74}{\sqrt{\frac{1.285^2}{30} + \frac{0.806^2}{19}}} \approx 3.98$$

Because 3.98 > 1.65, reject H_o. There is sufficient evidence, with $\alpha = 0.05$, to conclude that the mean score of Population 1 is greater then the mean score of Population 2.

COORDINATION / TRANSITIONS COMPONENT OF DANCE PROJECT #2

$H_o : \mu_1 - \mu_2 = 0$	This in no difference between the mean scores of Population 1 versus Population 2.
$H_a : \mu_1 - \mu_2 > 0$	This mean score of Population 1 is greater then the mean score of Population 2.

The level of significance of the test is $\alpha = 0.05$.

The test statistic used will be

$$Z = \frac{\overline{X} - \overline{Y}}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

With $\alpha = 0.05$ and a directional test, $z_c = 1.65$

If $z > z_c = 1.65$, then reject H_o.

With $\overline{x} = 6.47$, $s_1 = 1.332$, $n_1 = 30$, $\overline{y} = 5.79$, $s_2 = 2{,}839$, and $n_2 = 19$:

$$z = \frac{6.47 - 5.79}{\sqrt{\frac{1.3332^2}{30} + \frac{2.839^2}{19}}} \approx 0.98$$

Because 0.98 < 1.65, do not reject H_o. There is not sufficient evidence, with $\alpha = 0.05$, to conclude that the mean score on the part of the Dance Project for Population 1 is different from the mean score of Population 2.

SHOWMANSHIP AND STAGE PRESENCE COMPONENT OF DANCE PROJECT #3

$H_o : \mu_1 - \mu_2 = 0$	There is no difference between the mean scores of Population 1 versus Population 2.
$H_a : \mu_1 - \mu_2 > 0$	The mean score of Population 1 is greater than the mean score of Population 2.

The level of significance of the test is $\alpha = 0.05$.

The test statistic used will be

$$Z = \frac{\overline{X} - \overline{Y}}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

With $\alpha = 0.05$ and a directional test, $z_c = 1.65$

If $z > z_c = 1.65$, then reject H_o.

With $\overline{x} = 6.53$, $s_1 = 1.358$, $n_1 = 30$, $\overline{y} = 5.21$, $s_2 = 0.631$, and $n_2 = 19$:

$$z = \frac{6.53 - 5.21}{\sqrt{\frac{1.358^2}{30} + \frac{0.631^2}{19}}} \approx 4.60$$

Because $4.60 > 1.65$, reject H_o. There is sufficient evidence to conclude, with $\alpha = 0.05$, that the mean score on this component of the Dance Project for Population 1 is higher than the mean score for Population 2.

PROPER EXECUTION COMPONENT OF DANCE PROJECT #4

$H_o : \mu_1 - \mu_2 = 0$ There is no difference between the mean scores of population 1 versus Population 2.

$H_a : \mu_1 - \mu_2 > 0$ The mean score of Population 1 is greater than the mean score of Population 2.

The level of significance of the test is $\alpha = 0.05$.

The test statistic used will be

$$Z = \frac{\overline{X} - \overline{Y}}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

With $\alpha = 0.05$ and a directional test, $z_c = 1.65$

If $z > z_c = 1.65$, then reject H_o.

With $\overline{x}=6.60$, $s_1=1.303$, $n_1=30$, $\overline{y}=5.21$, $s_2=0.918$, and $n_2=19$:

$$z = \frac{6.60 - 5.21}{\sqrt{\frac{1.303^2}{30} + \frac{0.918^2}{19}}} \approx 4.37$$

Because $4.37 > 1.65$, reject H_o. There is sufficient evidence, with $\alpha=0.05$, to conclude that the mean score on this component of the Dance Project for Population 1 is higher than the mean score for Population 2.

SUMMARY

1. **Rhythm** - Students who were enrolled in the Monday, Wednesday, Friday class scored higher by a very small margin than those in the Tuesday, Thursday class. Average to good.

2. **Coordination / Transitions** - Students from the Monday, Wednesday, Friday class scored average to good while the Tuesday, Thursday class scored average to little above average.

3. **Showmanship and Stage Presence** - Students from the Monday, Wednesday, Friday class scored average to good, while the Tuesday, Thursday class scored average to a little above average.

4. **Proper execution** - Students from the Monday, Wednesday, Friday class scored average to good while the Tuesday, Thursday class scored average to a little above average.

The data analysis showed both classes had substantial improvement using the Dunham Technique. Both classes improved their skill and ability. However, dance classes held three days a week proved to be more beneficial than classes held twice a week. The students dancing three days a week retained more of the routine than those dancing twice a week. They also were able to practice the Dunham Technique more often than the other class. Even though the Tuesday, Thursday class met for a longer period of time, they were at a disadvantage because of a five day lapse between Thursday and Tuesday. The Monday, Wednesday, Friday class over all had people who were more experienced in dance and younger. The Tuesday, Thursday class had more older students who were not as competitive or experienced.

CONCLUSION

This dance project proved to be once again very beneficial to both classes. They learned the Dunham Technique at the beginning of the Semester and were graded twice on it during the semester.

LIMITATIONS

1. The Tuesday, Thursday class was at a disadvantage meeting just twice a week.

2. The Tuesday, Thursday class was overall not as experienced as those in the Monday, Wednesday, Friday class.

3. There were more older students in the Tuesday, Thursday class who always needed more time.

ENGLISH 1 / HISTORY 17 ESSAY

A RESEARCH PROJECT CONDUCTED BY
SUSAN MESSINA, ENGLISH INSTRUCTOR
AND
DIANE WHITE, HISTORY INSTRUCTOR
SOLANO COMMUNITY COLLEGE
FALL SEMESTER 1991

OVERVIEW

Introduction

One purpose of the traditional composition course is to teach students how to write the essays and essay exams that will be required in their other college classes. Still, faculty in disciplines all across the campus complain that their students can't write adequately. Because they assume that their students can't handle college level writing, social science and other discipline instructors often will not require students to write. Thus, students are denied opportunities to build their reading and writing skills outside of their English classes, a situation which creates a downward spiral in literacy demands across community college campuses. After a decade of working with various faculty in Writing Across the Curriculum situations at Solano, Susan Messina found an instructor in a content area, Diane White, who was interested in combining the teaching of her subject, U.S. History, with the traditional college composition course, English 1. The first paired course was offered in Fall 1989 and was followed by a second semester of the history/English pair and a new pairing of Biology/English (taught by John Nogue and Nan Wishner) in Spring 1990. Sabbatical and academic leaves made it impossible to offer the paired courses in 1990-91, but both pairs have been offered again in the current semester, Fall 1991.

The same thirty students take both classes; English 1 is scheduled for 12:00 and History 17 at 1:00 in the same room, but in reality the curriculum is completely integrated, and the two instructors intermix history and composition instruction throughout the two-hour period. All of the essays for English 1 are written about the books and topics studied in History 17. Both instructors grade all of the essays; although students earn separate grades, one in history, one in English, the majority of the criteria for evaluating the essays are integrated.

Background

Recognizing the importance of reading and writing in the learning process, all of the paired course instructors believe that students will learn more about both their academic subjects when they do so in a integrated context. In the paired context, the English student has a subject to write about, often a problem for freshman writers, and the history student learns not only that good writing is important and necessary in the content areas, but also how to structure an essay so that it will coherently demonstrate her/his understanding of the historical issue. In addition, integrated course students discover that good writing is necessary in all academic areas, not just English. In the first semesters of the paired teaching, all of the instructors believed that their students learned more in the paired environment, but had no documentation that that was the case.

Problem

In order to document for themselves, for counselors advising students about the classes, and for administrators considering the usefulness of these paired classes, whether students in the paired class did indeed learn more and develop better writing competence than they would have in separate classes, the instructors wanted to compare these classes with unpaired classes.

Purpose

The purpose of this study was to investigate the writing skills of students in the paired class compared with the writing skills of students in unpaired history and English classes. The expected outcome was that the paired class would show greater writing competence and greater history knowledge, which would be demonstrated in a written essay, than the unpaired class students.

Investigation

The research questions were

1) Is there any evidence that students in the treatment class write more competently than students in the exact control group?
2) Is there any indication that having completed college composition (English 1) before taking history leads to improved writing in history?

Assumption

One assumption in this study is that there is a cause-effect relationship between writing competence in a content area class and writing instruction in a college composition class.

A second assumption is that students do not normally make the transfer of writing competence to their content area courses easily.

Explanation and Hypothesis

The issue at question is whether integration of content and writing instruction is superior to learning both in separate classes. The hypothesis which we began is that the integrated learning situation is superior to separate classes.

Scope

This study investigated the writing of essays in U.S. history classes at the fourth and thirteenth weeks of a seventeen week semester in fall 1991. It compared one paired English/History 17 class with two unpaired History 17 classes. Two essays were written for the purpose of this study, the first before any English instruction occurred, and the second after four essays had been written by the English class.

Literature

No literature search was undertaken for this study.

METHODOLOGY

Design

Students in all three classes wrote two essays which were holistically scored by a team of the three history teachers, the paired class writing instructor, and two other composition instructors from the English department. Scores of the control group were compared with scores of the paired (treatment) class to see if greater improvement resulted from the integrated class method of instruction.

Populations

The treatment population is one paired English 1/History 17 class taught by the researchers. It consists of 27 students at the beginning of the study.

The control group population consists of two sections of History 17 taught by other Solano College history instructors, Richard Green (Social Sciences Division Chair) and Van Forsyth. Forsyth's section had 47 students at the beginning of the study; Green's class had 36 students at the beginning of the study numbers 83 students.

Thus, the total population of the study was 110 students all taking History 17, a survey of U.S. history to the Civil War.

Additionally, an exact control group was selected from the larger control group, consisting of those history students in the two control classes who were also taking English 1 simultaneously, but separately, this semester. Thus, they are getting similar writing instruction but not in an integrated instructional situation. There were a total of 16 students in this exact control group.

Instruments

Two essay questions were devised by the committee of six instructors who were also the evaluation team for the essays. The committee consisted of six Solano College instructors: Diane White, Richard Green, and Van Forsyth from history; and Susan Messina, Kathy Rosengren (Language Arts division chair), and Sharyn Stever, another English instructor. All instructors have had many years of experience teaching and evaluating writing in their respective fields.

The first essay question was on two articles assigned for student reading about New England Puritanism. The second essay question was about nineteenth century American slavery and was based on the student reading of The Slave Community by John Blassingame.

Copies of the questions are attached as Appendix I.

Procedure

In the fourth week, before English instruction in writing began in the treatment class, a baseline essay was written on the topic of New England Puritanism; students in all three history classes read the same two essays listened to one lecture of similar content by each of the three history instructors, and wrote on the same question. After paired class English instruction about how to write essays and the writing of four essays, the second research essay - the fifth in the semester in the treatment class - was written. As in the first essay, students in all three classes wrote for one class period of 50 minutes, and notes, articles, and books were allowed. Students did not know what the topic would be before the essay writing session.

Both the baseline and the second essay were holistically evaluated by the research committee of three history instructors and three English instructors. Prior to the evaluation session, the research committee agreed upon general criteria for excellence (see Appendix II). It was decided that a scale of 1 to 6 would be used, with 1 identifying the poorest essays and 6 identifying the best essays. Three sets of essays were chosen by the two researchers as exemplifying essays at each of the score levels through a quick reading of approximately half of the whole set of essays. Then discussion among the six evaluators led to agreement about what characteristics were typical of essays at each score level in this process known in holistic scoring as "norming."

Immediately following the approximately two-hour norming session, the evaluators read all of the essays and scored them in the range of 1 to 6. Every essay was read at least twice, once by an English instructor and once by a history instructor. The readings were done completely blindly; cover sheets with any identifying student or instructor names had been removed. A random code number had been assigned before the first reading to all students who wrote the baseline essay, and the same code number was used to identify students in the second essay. Thus, none of the evaluators knew which class any given essay had come from. To prevent influence from one evaluator to the next, all scores were covered by opaque stickers before the second evaluator read the papers. After two readings, one

166

researcher uncovered the scores and determined which essays had met with agreement amongst readers. Those papers on which the first two readers had not agreed on a score were read again until two readers reached agreement, usually with a third reading. When agreement was reached, scores were recorded. The primary data in this project thus comes from comparisons of the two essay scores in the treatment and control groups.

Collection of Data

The code numbers, instructor name, scores on essays 1 and 2, and difference between essays were recorded on a single sheet. Then comprehensive data collection sheets were developed for each of the three classes incorporating the information from the essay scores, academic transcript histories for each student, and self-reported data on a student survey.

From the academic transcripts, the researchers were able to identify those students in the control classes who were taking English 1 in separate classes; these students make up the exact control group. The researchers also identified students' previous courses in composition or reading from the transcript histories. So few students had taken any reading courses that this data was regarded as insignificant (questions 27, 28, 29, 31, 32, 33), although the generalization that emerged from that evidence is not unimportant: students are not availing themselves of courses which teach them college reading and study skills even when they are faced with a substantial reading load in college classes. Further analysis of the composition histories of the students in the large control group might be useful to the English department.

The following 34 variables were collected for each of the 110 students in the study:

1. History section
2. Score on Baseline Essay (Essay 1)
3. Score on Research Essay (Essay 2)
4. Semester Grade in History 17 (available after 12/20/91)
5. Semester Grade in English 1 (available after 12/20/91)
6. Major
7. Number of years since high school
8. Gender (M or F)
9. Ethnic Background (self-identified)
10. Number of hours of employment per week
11. Importance of college to close others
12. Importance of college to self
13. Educational goals
14. Reason for taking history
15. Reason for taking this section
16. Current SCC GPA
17. High school GPA (self-reported)
18. Previous units attempted at SCC
19. Previous units completed at SCC
20. Assessment test scores in reading
21. Assessment test scores in English (writing)

22. Is English your first language?
23. Date Assessment test taken
24. English "Level" (average of reading and writing assessment test scores)
25. Composition course being taken in current semester?
26. Composition course taken in past?
27. Reading course taken in past?
28. Reading course being taken in current semester?
29. Success level in highest reading course taken?
30. Success level in highest composition course taken?
31. Have you taken the Degrees of Reading Power test in a reading class or reading lab?
32. If yes, what was your score?
33. DRP date taken?
34. Highest level composition course completed with D or CR or above?

Some variables did not produce any useful information because there was too much variation, such as major. Others were not significant variables because there was too much similarity; nearly all students in the study reported that their educational goal was to transfer to a four-year school. Almost all students reported that English was their first language.

Data Processing

The data analysis consists of mean scores of the three groups: treatment, whole control, exact control and percentages of students scoring at each level in the three groups. In addition, since the treatment group had a larger percentage of students who were first semester students than the whole control group, subgroups of the whole control, exact control, and treatment groups were identified who had completed 0-5 units at SCC. Statistical analysis consists of the Mann-Whitney test and t-test to determine if the differences in means were significant.

Limitations

The researchers have identified several significant limitations in the methodology of this study. One of the most significant appears to be the number of units students have already completed at SCC; the more experienced students seem to be less likely to drop midsemester and may perform at higher levels throughout the semester. Informal conversations with treatment group students have revealed that even among students who have remained throughout the semester, the internalization of composition goals came much later in the semester, in the last two essays for some students, which was after the date of the research essay (Essay #5 in the treatment class). Given the current enrollment system at SCC, there is no way to balance the number of more experienced students and less experienced students in the treatment and control classes; however, the research essay could be given closer to the end of the semester to allow for maximum effect of the treatment instruction. Increasing the number of sections both in the treatment group and in the control group might allow the researchers to pull large enough subgroups of similar experience levels to produce an adequate sample size.

A second limitation of this study is more significant but is one which can be remedied in a future study, the researchers believe. Students were allowed to use the articles and book being written about during the essays because students in the treatment class have been allowed to do so in all of their in-class writing. However, the nature of this particular topic focused students' attention to specific pages and quotations and asked them to respond with evidence from the rest of the book in the research essay. What the evaluation committee found was an extensive amount of direct quotation from Blassingame without proper quotation or attribution and without enough of the students' own words in developing their ideas. The way the evaluators handled this problem is that scores of 2 or 3 were given to papers which had little of the students' own language and an excess of Blassingame's language. Scores of 4, 5, and 6 were given to papers that did show a student's capability to use and analyze Blassingame's information. Still, it is the opinion of the researchers that this methodology and essay exam administration format did not really give an accurate reflection of any of the students' capabilities to independently read and write about a history text. This limitation in this study can easily be remedied if another study is done. If we want to determine how well students comprehend and remember what they have read and then apply that understanding to writing, we should have allowed them to use only those tools (such as reading notes) which they have created themselves.

A third limitation is somewhat less significant than the first two. Students in the exact control group probably had already had some instruction, practice, and feedback in writing essays by the time the baseline essay was given in the fourth week of the semester; their separate English 1 classes had surely completed at least one essay and probably two by the fourth week. The treatment group had had instruction in reading, but not in writing because it was the researchers' idea to see what the students' writing capabilities were prior to instruction and then measure difference. The fourth week was chosen because the baseline essay was used as a first midterm exam in the control history classes so that there would be adequate and equal motivation in the both the control and treatment classes. The easiest solution is to offer typical English 1 instruction and at least one essay in the treatment class so that the exact control group and the treatment group would be approximately equal in level of instruction prior to the baseline essay. Another solution would be to have all classes write the baseline essay in the first or second week of the semester, which would actually be preferable in terms of getting a truer picture of students' writing capabilities before instruction.

FINDINGS

Tables and Charts

The data utilized in the following tables consists of the mean scores on Essays I and II, the students' enrollment histories taken from transcripts for each student in the study, and final course grades. Although the nature of community college classes is such that researchers will never be able to control for all variables within a classroom setting, several subgroups of the whole control group (two regularly scheduled History 17 classes) were identified as yielding some interesting results that help answer the research questions. The groups in Table 1 are defined as follows:

> 1. The **Whole Treatment Group** consists of the paired English 1/History 17 integrated class taught by the two researchers. It numbered 27 students for the first essay and 15 for the second essay.
>
> 2. The **Whole Control Group** consists of the two regularly scheduled History 17 classes taught by Richard Green and Van Forsyth. It numbered 83 students for the first essay and 61 for the second essay.
>
> 3. The **Exact Control Group** consists of students pulled from the Whole Control Group who were concurrently taking English 1 in a separate conventional class which was not linked to the history class. This group numbered 16 for the first essay and 13 for the second essay. This group, and a sub-group of it, is the most comparable to the Treatment Group because they are all taking the same two classes with the difference being the integrated instructional pattern of the paired treatment classes.
>
> 4. One difference that appeared to be a significant variable between the Treatment Group and the Control Groups was the number of semesters the students had previously attended college, the assumption being that more experienced students are likely to be more successful since the less successful students would have dropped out. The proportion of first-semester students was greater in the Treatment Group. Therefore the researchers pulled out sub-groups of students who had taken fewer than 6 credit units. These are the sub-groups identified as the **First Semester Treatment Group**, the **First Semester Exact Control Group**, and the **First Semester Whole Control Group.**
>
> 5. Another difference that became obvious as the researchers examined the transcripts was that many of the Whole Control Group had already completed English 1, and some had completed English 2, a composition and introduction to literature course, or other advanced English classes. A breakout of this subgroup allows the researchers to answer the second research question: Does having completed a college composition course before taking history lead to improved writing in history? This **Whole Control Composition Completed Group** is further subdivided into two groups: those who have completed only English 1, and those who have completed English 2 or another advanced English course as well. The number

of students in this whole subgroup was 42 on the first essay and 33 on the second essay.

6. Conversely, the researchers wanted to know whether lack of a college-level composition course led to lower scores on the essays, so a second subgroup of the whole control group was pulled, the **Whole Control No/Low Composition Group**, which consisted of 23 students writing the first essay and 13 students writing the second essay. These students have a) taken or are concurrently taking a pre-college level composition course (English 350, 355, or 370), b) attempted but dropped or failed English 1, or c) never attempted an English course at all.

The methodological approach used to analyze this essay score data is to determine the mean score on the first essay (which was given in the fourth week) and compare it with the mean score on the second essay (which was given in the thirteenth week). The researchers include both the highest mean score (in all cases the mean score on Essay II was higher than on Essay I, although many individual students had lower scores on Essay II) and the mean degree of improvement between Essay I and Essay II.

Two sets of means have been computed, those including "drops," i.e., students who wrote the first essay, but not the second, regardless of whether they dropped the class officially, and those excluding the "drops." Since students drop for a wide variety of reasons, and no research was done on why students dropped, the researchers believe the data excluding the drops is the more valuable for this study; it will be presented in bold face type in Table 1 below.

Table 1. Mean Scores on Essays I and II

Line	Group	Number of Students (N)	Mean Score on Essay I	Mean Score on Essay II	Improvement
1.	Whole Treatment	27	3.15	2.15	-1.00
	(Without drops)	**15**	**3.73**	**3.87**	**.14**
2.	Whole Control	83	2.54	2.69	.15
	(Without drops)	**61**	**2.69**	**3.66**	**.97**
1.	Whole Treatment	27	3.15	2.15	-1.00
	(Without drops)	**15**	**3.73**	**3.87**	**.14**
3.	Exact Control	16	2.12	2.7	.63
	(Without drops)	**13**	**1.92**	**3.38**	**1.46**
4.	First Semester Treatment	21	3.24	2.33	.91
	(Without drops)	**12**	**3.75**	**4.08**	**.43**
5.	First Semester Exact Control	6	2.33	3.17	.84
	(Without drops)	**5**	**2.20**	**3.80**	**1.60**
6.	First Semester Whole Control	18	2.5	2.78	.28
	(Without drops)	**15**	**2.6**	**3.33**	**.73**

Table 2. Mean Scores on Essays I and II: Prior Composition Class Analysis

Line	Group	Number of Students (N)	Mean Score on Essay I	Mean Score on Essay II	Improvement
1.	Whole Treatment	27	3.15	2.15	-1.00
	(Without drops)	**15**	**3.73**	**3.87**	**.14**
7.	Whole Control Composition Completed	42	2.81	3.24	.43
	(Without drops)	**33**	**2.88**	**4.12**	**1.24**
8.	WCCC-Completed E1	29	2.62	3.21	.59
	(Without drops)	**21**	**2.71**	**4.43**	**1.72**
9.	WCCC-Completed E2+	13	3.23	3.31	.08
	(Without drops)	**12**	**3.17**	**3.58**	**.41**
1.	Whole Treatment	27	3.15	2.15	-1.00
	(Without drops)	**15**	**3.73**	**3.87**	**.14**
10.	Whole Control No/Low Composition	23	2.17	1.57	- .60
		13	**2.69**	**2.77**	**.08**

Findings

The two general research questions were

1. Is there any evidence that students in the treatment class write more competently than students in the exact control group?

2. Is there any indication that having completed college composition (English 1) before taking history leads to improved writing in history?

The answer that emerges from this study is a qualified "yes" to both questions.

First, if the whole group means (those including the drops) in the tables above are examined, the treatment group's mean score on Essay II is lower than on Essay I and is lower than any of the control groups because of the high percentage of zeros added in for the drops. Drops in the treatment groups are over 40 %, while drops in the exact control group are under 20%.

Table 3. Percentage of Drops in Groups

Group	Percent of Students Not Writing Essay II
1. Whole Treatment	**44 %**
2. Whole Control	27 %
3. Exact Control	19 %
4. First Semester Treatment	**43 %**
5. First Semester Exact Control	17 %
6. First Semester Whole Control	17 %
7. Whole Control Composition Completed	21 %
8. Whole Control Composition Completed Eng.1	28 %
9. Whole Control Composition Completed Eng.2	8 %
10.Whole Control No/Low Composition	43 %

Because of this disparity in percentages of drops, which therefore affects the means differently, the researchers have concentrated on comparison of the means without drops included. All discussion of findings is based on the without drops means. (Further research is needed to discover why the drop rate is higher in the paired class, although an intuitive answer is that paired class students realize they must do all of the reading in order to write the essays, whereas in a lecture class, a satisfactory grade can sometimes be achieved even if all of the reading is not done.)

To answer research question one the data in Table 1 shows slightly higher scores on Essay II for the treatment group; however, statistical analysis of both the Mann-Whitney test and the t-test indicate no statistically significant difference on Essay II (data included in Appendix III). What is interesting is the statistically significant difference found for all control groups compared to the treatment group for Essay I. The researchers expected that the exact control group might score higher than the treatment group on Essay I because the control group would have already had four weeks of composition instruction in their separate English 1 classes and would surely have completed at least one essay prior to research Essay I. In a deliberate attempt not to teach composition skills before Essay I, the researchers taught reading skills in the first four weeks and the class completed a book on the Puritans, which was the general subject of Essay I, though none of the specific information covered in the Essay I readings was covered in the Treatment group's book on Puritanism. It is possible that this greater degree of background knowledge about Puritanism enabled Treatment students to perform at a higher level on Essay I. Another possibility is that the Treatment group is of higher average ability as measured by reading and writing assessment test scores. That question would be difficult to answer because there is no uniform ability measure taken. Some additional analysis might argue for the positive effect of the reading on the writing. In the treatment group, one semester-long assignment was to keep a reading journal for each of the history monographs; all but one student earning a passing grade in History 17 in the treatment group completed 90 - 100% of the journal assignments, while none of the failing students completed more than 66% of the reading journal assignments.

This data shows the importance of completing the reading as a basis for writing and supports the explanation that the treatment students performed better on Essay I because they had done more reading on the topic of Puritanism than the control group students had.

Still, the non-significant difference in Essay II scores for the treatment group needs to be accounted for. It is the belief of the researchers that the structure of the Essay II assignment, which was based on student reading of a book on slavery to be done independently and without class discussion, was too difficult for all but the best students in both the treatment and control groups to handle independently. This, coupled with the evidence of the importance of class discussion of the reading before writing Essay I, leads the researchers to think that a significant change in the nature of how the reading is handled must be made in the methodological design of this study before replication.

Because there was little difference in the scores on Essays I and II in the treatment group (because they scored so high on Essay I), that measure proved not to be as informative for the treatment group as the researchers had hoped it would be. What is interesting about the improvement measure is that even groups who had already completed English 1 showed great improvement between Essay I and Essay II because they had not scored high on Essay I. One wonders why they were not able to muster their composition knowledge for Essay I, a question that could only be answered with a qualitative study.

One major concern that emerges from these findings is that all of the groups' scores are lower than 4.00 in Table 1 data (with the exception of the First Semester Treatment group score on Essay II). When the English Department gives a similar essay exam at the end of developmental composition classes, it regards a score of 4 as the level a student must achieve in order to be ready to enter college composition. The Composition Completed groups (7 and 8) both had Essay II scores of slightly over 4, but interestingly, the group which had completed an advanced English class dropped down to a 3.58 on Essay II, which is an unexpected result.

Final semester grade data also give some support to the value of the paired class, especially with the qualification that the integrated treatment worked well for those students who did do all, or most, of the reading assigned which was then the subject of the writing in the integrated class.

Table 4. Final Semester Grades in History 17

GROUP	PERCENTAGE OF	A	B	C	D	F	W	I
Treatment		20	20	13	20	27		
Exact Control		15	23	38	8	15		

Table 5. Final Semester Grades in English 1

GROUP	PERCENTAGE OF	A	B	C	D	F	W	I
Treatment		20	20	13	20	27		
Exact Control		8	23	46	0	0	15	8

In both treatment and control history classes, there is a greater percentage of students who remain in the class but fail. In the exact control group students who were taking English 1 separately, there is a drop and incomplete percentage that is close to the fail percentage in the paired class. What is substantially different though is the percentage earning A grades; the treatment class had more than twice the number of students who earned A's. Thus, a conclusion can be drawn that the paired class enabled good students to excel to a greater degree than the separate classes did. Also interesting is the larger percentage of C grades in the control group; the C and D grades seem to be separated more distinctly in the treatment class. It is possible that the role of reading completion and comprehension was significant here. That would be an interesting area for qualitative exploration in a future study.

Table 6 shows the percentage of students scoring at each level on both Essay I and Essay II. On both essays, more treatment group students scored at the 4, 5, and 6 levels in four of the six instances. This data leads us to conclude that the paired instruction environment did indeed lead to greater writing competence as demonstrated by the greater number of treatment students scoring at levels 4, 5, and 6.

In sum, the final grade data shows support for the superiority of the treatment class at the top end of the grade scale.

The data in Table 2 answers the second research question the full semester of English 1, but also continued writing practice in the context of a content area class. This group scored 2.71 on Essay I and 4.43 on Essay II for a gain of 1.72. The relatively low score on Essay I is curious and unexpected for all three of these Composition Completed groups. One possible explanation is that the criteria for grading included use of the reading material to support the point being made, an approach to writing about history that might have been unfamiliar on Essay I but was understood to be expected by Essay II.

Even more unexpected is the Essay II performance of the Whole Control Composition Completed subgroup which had completed not only English 1 but also a second college level English class; this group, which the researchers expected to perform at the highest level of all the groups, actually scored lower on Essay II than those who had completed just one college level class (English 1) and also lower than the Whole Treatment group. This finding is hard to explain. Perhaps the emphasis on analysis of and writing about literature in the second composition class gets students away from thinking about the organizational patterns more typical of English 1. Still, more writing experience would have been expected to lead to higher performance.

Nonetheless, the conclusion that having taken a college level composition class does lead to improved writing in history class is also supported by the data from the Whole Control No/Low Composition group. This group is taking History 17 but has taken only a developmental composition class or no composition class at all. English department faculty would expect this group to have a hard time writing adequate essays for History 17, and that is what the data reveals. This group scored a full point below the Treatment group on Essay II and 1.66 points below the group which had already completed English 1, the highest scoring group on Essay II. This group also had the highest drop rate of all the control subgroups; its drop rate is 43%, very similar to the 44% of the Treatment group.

Thus, the low scores of the group which has had low or no composition and the high scores of the group which has already completed English 1 do indicate that taking college level composition before taking History 17 leads to improved writing performance in history class, although the taking of an advanced composition class does not appear to add--indeed, is a scoring detriment in this data--to history writing competence. Despite this qualification, the answer to research question 2 appears to be positive based on this study's data.

Interpretation

While this study did not yield quite the expected results for research question one, it was very informative with respect to the importance of reading in history, and it brought substantive evidence forth to support research question two. Whether the cause of the unexpected findings lies in the research methodology--and it's quite likely that it does, in the opinion of the researchers--or whether this data represents a true and accurate picture of the writing competence developed in the two modes of instruction is not clear. The only way to tell is to replicate the study, correcting the methodological problems and to discover whether similar results occur or whether more improvement is shown in paired class student's writing competence. The researchers are part of a grant proposal which would fund such modification and extension of this study.

APPENDIX I: ESSAY EXAM QUESTIONS I AND II

Essay 1: New England Puritanism

Student's Name ____________________

Student's Social Security Number ________

History Instructor's Name ____________

Date ____________________________

(Students: Please fill in the information above the line, but do not write below the line. Thanks.)

Student Code Number ________________

Essay I Score ______________________

Students: Please do not write in these spaces above the double line. Begin reading the topic for your essay below the line. Then write your essay on the lined pages following the topic. If you need more room, write on back of lined page, and write a note at bottom of page 3 to direct reader to your page 4. Please write in ink if possible; neat cross-outs and corrections are quite acceptable. Do not write your name or your instructor's name anywhere on this sheet or on your essay pages.

	Score	Reader Code
First Reading		
Second Reading		
Third Reading		
Fourth Reading		

STUDENT CODE NUMBER____________TOTAL SCORE

ESSAY I TOPIC

Mary Rowlandson and Anne Hutchinson lived their experiences in the context of first generation New England Puritanism. Mary Rowlandson's narrative of captivity reflects the Puritan belief that God was "on the Puritan side." Rowlandson was able to use her experience to confirm and strengthen her faith: 'Before I knew what affliction meant, I was sometimes ready to wish for it,' she admitted. 'But now I see the Lord has his time to scourge and chasten me.'" In viewing her trials during captivity as God's testing of her faith, Rowlandson was typical of many Puritans living through their wilderness experience, and her whole community drew upon her experiences to strengthen their faith that God intended their community to prosper as a special example of a community living under the Word of God.

Anne Hutchinson's beliefs and experiences, on the other hand, "challenged" the colony's hierarchical structure and fundamental beliefs. "Her 'ready wit and bold spirit' aroused a fear that moved the founding fathers to an inelegant harshness." She promoted "her own beliefs which differed from those of the Boston ministers." She charged that "the ministers of Boston preached too much that people could be saved only by 'works'--by following the Scriptures and the Ten Commandments." Consequently, her community banished her from the colony.

Although both of these women considered themselves to be good Puritans, they saw their roles as Puritan women differently, and the Puritan community responded to them and their beliefs and experiences differently. Analyze the similarities and differences between Hutchinson and Rowlandson using their beliefs, experiences, and actions to support your explanations. You may use material from lecture and the two readings, as well as what you remember from any other reading you have done on 17th C. Puritans.

Essay 2: 19 th C. American Slavery

Student's Name ____________________

Student's Social Security Number________

History Instructor's Name______________

Date

(Students: Please fill in the information above the line, but do not write below the line. Thanks.)

Student Code Number__________________

Essay 2 Score________________________

Essay 2: 19 th C. American Slavery

Student's Name ______________________

Student's Social Security Number________

History Instructor's Name_______________

Date _______________________________

(Students: Please fill in the information above the line, but do not write below the line. Thanks.)

Student Code Number____________________

Essay 2 Score__________________________

Students: Read the following topic for your essay. Then write your essay on the lined pages which are attached. If you need more room, write on back of a lined page, and write a note at bottom of page 3 to direct reader to your page 4. Please write in ink if possible; neat cross-outs and corrections are quite acceptable. Do not write your name or your instructor's name anywhere on this sheet or on your essay pages.

ESSAY TOPIC: 19 th C. AMERICAN SLAVERY

Through most of American history, slaves in the pre-Civil War South have been thought of as passive field workers living out their lives with little resistance. This perception has existed in part because of stereotypical descriptions of African American slave life. In The Slave Community, Blassingame challenges this view of slave culture.

In Chapter 6, Blassingame describes a "complex and contradictory portrait of the slave which emerges from antebellum Southern literature" (224). In your essay, compare and contrast Blassingame's description of the stereotypical slave characters, "Sambo, Jack, and Nat," with the realities of slave life and character. In your essay, distinguish among the views about slaves held by white plantation owners, other Southern and Northern whites, and the portrait of real slave culture as presented throughout the book.

As part of your discussion, explain what beliefs and assumptions led to the development and acceptance of each of the stereotypes.

Give examples from The Slave Community to support your points throughout your essay. You are also encouraged to include information from lecture and other reading which would support your analysis.

Students: Please do not write in the spaces below.

	Score	Reader Code
First Reading		
Second Reading		
Third Reading		
Fourth Reading		

STUDENT CODE NUMBER___________TOTAL SCORE______

ESSAY 2: 19 th C. AMERICAN SLAVERY

ESSAY 2: 19 th C. AMERICAN SLAVERY

APPENDIX II: GENERAL CRITERIA FOR EVALUATING ESSAYS

HISTORY/ENGLISH WRITING RESEARCH PROJECT

FALL 1991

Essay I and Essay II Scoring Criteria

1. Degree of historical accuracy. This criterion applies throughout whole essay, is to be judged along with each of the following structural criteria.

2. Clear thesis statement showing the point the writer will make.

3. Adequacy of detail and development in support of thesis.

4. Relevance of supporting detail.

5. Adequacy of analyis, how well the writer has explained how and why the support proves the thesis.

6. Clarity of organization and coherence.

7. Adequacy of sentence structure and mechanics to achieve clarity without hindering meaning.

APPENDIX III: STATISTICAL TEST DATA

testing median of group 1 = to group 2
vs. ≠ 90% conf. α = 10%

```
MTB > EXECUTE 'B:TEST1.CMD'
MTB > MANN-WHITNEY 90 'T1' 'S21'

Mann-Whitney Confidence Interval and Test

T1          N =  15     Median =        4.000
S21         N =  61     Median =        3.000
Point estimate for ETA1-ETA2 is        1.000
90.3 pct c.i. for ETA1-ETA2 is (-0.001,2.000)
W = 789.5
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.0058
The test is significant at 0.0045 (adjusted for ties)
```

diff

```
MTB > MANN-WHITNEY 90 'T1' 'S31'

Mann-Whitney Confidence Interval and Test

T1          N =  15     Median =        4.000
S31         N =  13     Median =        2.000
Point estimate for ETA1-ETA2 is        2.000
90.3 pct c.i. for ETA1-ETA2 is (1.000,2.000)
W = 294.5
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.0004
The test is significant at 0.0003 (adjusted for ties)
```

diff

```
MTB > MANN-WHITNEY 90 'T1' 'S71'

Mann-Whitney Confidence Interval and Test

T1          N =  15     Median =        4.000
S71         N =  33     Median =        3.000
Point estimate for ETA1-ETA2 is        1.000
90.0 pct c.i. for ETA1-ETA2 is (0.000,2,000)
W = 459.5
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.0418
The test is significant at 0.0369 (adjusted for ties)
```

diff.

```
MTB > MANN-WHITNEY 90 'T1' 'S81'

Mann-Whitney Confidence Interval and Test

T1          N =  15     Median =        4.000
S81         N =  21     Median =        3.000
Point estimate for ETA1-ETA2 is        1.000
90.5 pct c.i. for ETA1-ETA2 is (-0.000,1.999)
W = 348.0
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.0247
The test is significant at 0.0213 (adjusted for ties)
```

diff

```
MTB > MANN-WHITNEY 90 'T1' 'S91'

Mann-Whitney Confidence Interval and Test

T1          N =  15     Median =        4.000
S91         N =  12     Median =        3.000
Point estimate for ETA1-ETA2 is         1.000
90.8 pct c.i. for ETA1-ETA2 is (0.001,1.000)
W = 231.5
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.3055
The test is significant at 0.2919 (adjusted for ties)
Cannot reject at alpha = 0.05
```

same.

```
MTB > MANN-WHITNEY 90 'T1' 'S101'

Mann-Whitney Confidence Interval and Test

T1          N =  15     Median =        4.000
S101        N =  13     Median =        3.000
Point estimate for ETA1-ETA2 is         1.000
90.3 pct c.i. for ETA1-ETA2 is (0.000,2.000)
W = 266.0
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.0270
The test is significant at 0.0211 (adjusted for ties)
```

diff.

```
MTB > MANN-WHITNEY 90 'S41' 'S51'

Mann-Whitney Confidence Interval and Test

S41         N =  12     Median =        4.000
S51         N =   5     Median =        2.000
Point estimate for ETA1-ETA2 is         2.000
91.8 pct c.i. for ETA1-ETA2 is (1.000,2.999)
W = 129.5
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.0269
The test is significant at 0.0229 (adjusted for ties)
```

diff

```
MTB > MANN-WHITNEY 90 'S41' 'S61'

Mann-Whitney Confidence Interval and Test

S41         N =  12     Median =        4.000
S61         N =  15     Median =        2.000
Point estimate for ETA1-ETA2 is         1.000
90.8 pct c.i. for ETA1-ETA2 is (1.000,2.000)
W = 222.0
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.0090
The test is significant at 0.0067 (adjusted for ties)
```

diff.

Test 2

```
MTB > MANN-WHITNEY 90 'T2' 'S22'

Mann-Whitney Confidence Interval and Test

T2          N =  15     Median =       4.000
S22         N =  61     Median =       4.000
Point estimate for ETA1-ETA2 is       -0.000
90.3 pct c.i. for ETA1-ETA2 is (-1.000,0.999)
W = 623.0
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.5570
The test is significant at 0.5485 (adjusted for ties)
Cannot reject at alpha = 0.05
```

same

```
MTB > MANN-WHITNEY 90 'T2' 'S32'

Mann-Whitney Confidence Interval and Test

T2          N =  15     Median =       4.000
S32         N =  13     Median =       3.000
Point estimate for ETA1-ETA2 is        1.000
90.3 pct c.i. for ETA1-ETA2 is (-1.001,1.999)
W = 233.0
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.4896
The test is significant at 0.4825 (adjusted for ties)
Cannot reject at alpha = 0.05
```

same

```
MTB > MANN-WHITNEY 90 'T2' 'S72'

Mann-Whitney Confidence Interval and Test

T2          N =  15     Median =       4.000
S72         N =  33     Median =       4.000
Point estimate for ETA1-ETA2 is        0.000
90.0 pct c.i. for ETA1-ETA2 is (-0.999,1.000)
W = 353.0
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.7555
The test is significant at 0.7494 (adjusted for ties)
Cannot reject at alpha = 0.05
```

same

```
MTB > MANN-WHITNEY 90 'T2' 'S82'

Mann-Whitney Confidence Interval and Test

T2          N =  15     Median =       4.000
S82         N =  21     Median =       4.000
Point estimate for ETA1-ETA2 is       -1.000
90.5 pct c.i. for ETA1-ETA2 is (-1.000,-0.000)
W = 248.0
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.3521
The test is significant at 0.3410 (adjusted for ties)
Cannot reject at alpha = 0.05
```

same

```
MTB > MANN-WHITNEY 90 'T2' 'S92'

Mann-Whitney Confidence Interval and Test

T2          N =  15     Median =        4.000
S92         N =  12     Median =        4.000
Point estimate for ETA1-ETA2 is         1.000
90.8 pct c.i. for ETA1-ETA2 is (-1.000,1.000)
W = 225.0
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.4792
The test is significant at 0.4678 (adjusted for ties)
Cannot reject at alpha = 0.05
```

same

```
MTB > MANN-WHITNEY 90 'T2' 'S102'

Mann-Whitney Confidence Interval and Test

T2          N =  15     Median =        4.000
S102        N =  13     Median =        3.000
Point estimate for ETA1-ETA2 is         1.000
90.3 pct c.i. for ETA1-ETA2 is (0.000,2.000)
W = 259.0
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.0589
The test is significant at 0.0539 (adjusted for ties)
Cannot reject at alpha = 0.05
```

diff.

```
MTB > MANN-WHITNEY 90 'S42' 'S52'

Mann-Whitney Confidence Interval and Test

S42         N =  12     Median =        5.000
S52         N =   5     Median =        3.000
Point estimate for ETA1-ETA2 is         0.000
91.8 pct c.i. for ETA1-ETA2 is (-0.999,2.000)
W = 109.0
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.9580
The test is significant at 0.9566 (adjusted for ties)
Cannot reject at alpha = 0.05
```

Same.

```
MTB > MANN-WHITNEY 90 'S42' 'S62'

Mann-Whitney Confidence Interval and Test

S42         N =  12     Median =        5.000
S62         N =  15     Median =        3.000
Point estimate for ETA1-ETA2 is         1.000
90.8 pct c.i. for ETA1-ETA2 is (0.001,2.000)
W = 192.5
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.2416
The test is significant at 0.2283 (adjusted for ties)
Cannot reject at alpha = 0.05
```

same.

BEST COPY AVAILABL

```
MTB > MANN-WHITNEY 90 'TDIFF' 'S2DIFF';
SUBC> ALTERNATIVE=+1.

Mann-Whitney Confidence Interval and Test

TDIFF       N =  15     Median =       1.000
S2DIFF      N =  61     Median =       1.000
Point estimate for ETA1-ETA2 is      -1.000
90.3 pct c.i. for ETA1-ETA2 is (-1.001,0.000)
W = 443.0
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.0803
The test is significant at 0.0723 (adjusted for ties)
Cannot reject at alpha = 0.05

MTB > MANN-WHITNEY 90 'TDIFF' 'S3DIFF';
SUBC> ALTERNATIVE=+1.

Mann-Whitney Confidence Interval and Test

TDIFF       N =  15     Median =       1.000
S3DIFF      N =  13     Median =       2.000
Point estimate for ETA1-ETA2 is      -1.000
90.3 pct c.i. for ETA1-ETA2 is (-2.000,-0.000)
W = 169.5
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.0287
The test is significant at 0.0250 (adjusted for ties)

MTB > MANN-WHITNEY 90 'TDIFF' 'S7DIFF';
SUBC> ALTERNATIVE=+1.

Mann-Whitney Confidence Interval and Test

TDIFF       N =  15     Median =       1.000
S7DIFF      N =  33     Median =       1.000
Point estimate for ETA1-ETA2 is      -1.000
90.0 pct c.i. for ETA1-ETA2 is (-2.000,-0.000)
W = 268.0
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.0277
The test is significant at 0.0234 (adjusted for ties)

MTB > MANN-WHITNEY 90 'TDIFF' 'S8DIFF';
SUBC> ALTERNATIVE=+1.

Mann-Whitney Confidence Interval and Test

TDIFF       N =  15     Median =       1.000
S8DIFF      N =  21     Median =       2.000
Point estimate for ETA1-ETA2 is      -1.000
90.5 pct c.i. for ETA1-ETA2 is (-2.000,-1.000)
W = 188.0
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.0045
The test is significant at 0.0032 (adjusted for ties)
```

```
MTB > MANN-WHITNEY 90 'TDIFF' 'S9DIFF';
SUBC> ALTERNATIVE=+1.

Mann-Whitney Confidence Interval and Test

TDIFF       N =  15      Median =        1.000
S9DIFF      N =  12      Median =        0.500
Point estimate for ETA1-ETA2 is        -0.000
90.8 pct c.i. for ETA1-ETA2 is (-1.000,1.000)
W = 200.0
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.6430
The test is significant at 0.6331 (adjusted for ties)
Cannot reject at alpha = 0.05

MTB > MANN-WHITNEY 90 'TDIFF' 'S10DIFF';
SUBC> ALTERNATIVE=+1.

Mann-Whitney Confidence Interval and Test

TDIFF       N =  15      Median =        1.000
S10DIFF     N =  13      Median =        0.000
Point estimate for ETA1-ETA2 is        -0.000
90.3 pct c.i. for ETA1-ETA2 is (-1.000,0.999)
W = 226.5
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.6954
The test is significant at 0.6859 (adjusted for ties)
Cannot reject at alpha = 0.05

MTB > MANN-WHITNEY 90 'S4DIFF' 'S5DIFF

Mann-Whitney Confidence Interval and Test

S4DIFF      N =  12      Median =        1.000
S5DIFF      N =   5      Median =        2.000
Point estimate for ETA1-ETA2 is        -1.000
91.8 pct c.i. for ETA1-ETA2 is (-3.000,-0.001)
W = 90.0
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.0651
The test is significant at 0.0492 (adjusted for ties)

MTB > MANN-WHITNEY 90 'S4DIFF' 'S6DIFF

Mann-Whitney Confidence Interval and Test

S4DIFF      N =  12      Median =        1.000
S6DIFF      N =  15      Median =        0.000
Point estimate for ETA1-ETA2 is         0.000
90.8 pct c.i. for ETA1-ETA2 is (-1.000,1.000)
W = 159.0
Test of ETA1 = ETA2  vs.  ETA1 n.e. ETA2 is significant at 0.6783
The test is significant at 0.6699 (adjusted for ties)
Cannot reject at alpha = 0.05
```

$\mu_i = \mu_j$

```
MTB > TWOSAMPLE 90 'T1' 'S21'
TWOSAMPLE T FOR T1 VS S21
      N       MEAN     STDEV   SE MEAN
T1   15       3.73      1.16      0.30
S21  61       2.69      1.20      0.15
90 PCT CI FOR MU T1 - MU S21: (0.47, 1.62)
TTEST MU T1 = MU S21 (VS NE): T= 3.10  P=0.0053  DF=  22
```

N diff

```
MTB > TWOSAMPLE 90 'T1' 'S31'
TWOSAMPLE T FOR T1 VS S31
      N       MEAN     STDEV   SE MEAN
T1   15       3.73      1.16      0.30
S31  13      1.923     0.862      0.24
90 PCT CI FOR MU T1 - MU S31: (1.15, 2.47)
TTEST MU T1 = MU S31 (VS NE): T= 4.72  P=0.0001  DF=  25
```

N diff

```
MTB > TWOSAMPLE 90 'T1' 'S71'
TWOSAMPLE T FOR T1 VS S71
      N       MEAN     STDEV   SE MEAN
T1   15       3.73      1.16      0.30
S71  33       2.88      1.32      0.23
90 PCT CI FOR MU T1 - MU S71: (0.21, 1.50)
TTEST MU T1 = MU S71 (VS NE): T= 2.26  P=0.031  DF=  30
```

N diff

```
MTB > TWOSAMPLE 90 'T1' 'S81'
TWOSAMPLE T FOR T1 VS S81
      N       MEAN     STDEV   SE MEAN
T1   15       3.73      1.16      0.30
S81  21       2.71      1.35      0.29
90 PCT CI FOR MU T1 - MU S81: (0.31, 1.73)
TTEST MU T1 = MU S81 (VS NE): T= 2.43  P=0.021  DF=  32
```

N diff

```
MTB > TWOSAMPLE 90 'T1' 'S91'
TWOSAMPLE T FOR T1 VS S91
      N       MEAN     STDEV   SE MEAN
T1   15       3.73      1.16      0.30
S91  12       3.17      1.27      0.37
90 PCT CI FOR MU T1 - MU S91: (-0.25, 1.38)
TTEST MU T1 = MU S91 (VS NE): T= 1.20  P=0.24  DF=  22
```

Y Same

```
MTB > TWOSAMPLE 90 'T1' 'S101'
TWOSAMPLE T FOR T1 VS S101
       N       MEAN     STDEV   SE MEAN
T1    15       3.73      1.16      0.30
S101  13      2.692     0.855      0.24
90 PCT CI FOR MU T1 - MU S101: (0.39, 1.69)
TTEST MU T1 = MU S101 (VS NE): T= 2.72  P=0.012  DF=  25
```

N diff

```
MTB > TWOSAMPLE 90 'S41' 'S51'
TWOSAMPLE T FOR S41 VS S51
      N       MEAN     STDEV   SE MEAN
S41  12      3.750     0.965      0.28
S51   5       2.20      1.10      0.49
90 PCT CI FOR MU S41 - MU S51: (0.45, 2.65)
TTEST MU S41 = MU S51 (VS NE): T= 2.75  P=0.033  DF=  6
```

N diff

BEST COPY AVAILABLE

$\mu_i = \mu_j$

```
MTB > TWOSAMPLE 90 'S41' 'S61'
TWOSAMPLE T FOR S41 VS S61
        N        MEAN      STDEV   SE MEAN
S41   12       3.750      0.965      0.28
S61   15       2.600      0.986      0.25
90 PCT CI FOR MU S41 - MU S61: (0.50, 1.80)
TTEST MU S41 = MU S61 (VS NE): T= 3.05  P=0.0057  DF=  23
```

N diff

T2

```
MTB > TWOSAMPLE 90 'T2' 'S22'
TWOSAMPLE T FOR T2 VS S22
        N        MEAN      STDEV   SE MEAN
T2    15        3.87       1.60      0.41
S22   61        3.66       1.38      0.18
90 PCT CI FOR MU T2 - MU S22: (-0.56, 0.99)
TTEST MU T2 = MU S22 (VS NE): T= 0.47  P=0.64  DF=  19
```

Y same

```
MTB > TWOSAMPLE 90 'T2' 'S32'
TWOSAMPLE T FOR T2 VS S32
        N        MEAN      STDEV   SE MEAN
T2    15        3.87       1.60      0.41
S32   13        3.38       1.80      0.50
90 PCT CI FOR MU T2 - MU S32: (-0.63, 1.59)
TTEST MU T2 = MU S32 (VS NE): T= 0.74  P=0.46  DF=  24
```

Y same

```
MTB > TWOSAMPLE 90 'T2' 'S72'
TWOSAMPLE T FOR T2 VS S72
        N        MEAN      STDEV   SE MEAN
T2    15        3.87       1.60      0.41
S72   33        4.12       1.14      0.20
90 PCT CI FOR MU T2 - MU S72: (-1.04, 0.54)
TTEST MU T2 = MU S72 (VS NE): T= -0.56  P=0.58  DF=  20
```

Y same

```
MTB > TWOSAMPLE 90 'T2' 'S82'
TWOSAMPLE T FOR T2 VS S82
        N        MEAN      STDEV   SE MEAN
T2    15        3.87       1.60      0.41
S82   21        4.43       1.21      0.26
90 PCT CI FOR MU T2 - MU S82: (-1.40, 0.28)
TTEST MU T2 = MU S82 (VS NE): T= -1.15  P=0.26  DF=  24
```

Y same

```
MTB > TWOSAMPLE 90 'T2' 'S92'
TWOSAMPLE T FOR T2 VS S92
        N        MEAN      STDEV   SE MEAN
T2    15        3.87       1.60      0.41
S92   12       3.583      0.793      0.23
90 PCT CI FOR MU T2 - MU S92: (-0.53, 1.10)
TTEST MU T2 = MU S92 (VS NE): T= 0.60  P=0.55  DF=  21
```

Y same

```
MTB > TWOSAMPLE 90 'T2' 'S102'
TWOSAMPLE T FOR T2 VS S102'
         N        MEAN      STDEV   SE MEAN
T2      15        3.87       1.60      0.41
S102    13        2.77       1.17      0.32
90 PCT CI FOR MU T2 - MU S102: (0.20, 1.99)
TTEST MU T2 = MU S102 (VS NE): T= 2.09  P=0.047  DF=  25
```

N diff

```
MTB > TWOSAMPLE 90 'S42' 'S52'
TWOSAMPLE T FOR S42 VS S52
       N       MEAN      STDEV   SE MEAN
S42  12       4.08       1.68       0.48
S52   5       4.00       1.41       0.63
90 PCT CI FOR MU S42 - MU S52: (-1.40, 1.56)
TTEST MU S42 = MU S52 (VS NE): T= 0.10  P=0.92  DF=  8
```

Y same

```
MTB > TWOSAMPLE 90 'S42' 'S62'
TWOSAMPLE T FOR S42 VS S62
       N       MEAN      STDEV   SE MEAN
S42  12       4.08       1.68       0.48
S62  15       3.33       1.35       0.35
90 PCT CI FOR MU S42 - MU S62: (-0.28, 1.78)
TTEST MU S42 = MU S62 (VS NE): T= 1.26  P=0.22  DF=  20
```

Y same.

```
MTB > TWOSAMPLE 90 'TDIFF' 'S2DIFF';
SUBC> ALTERNATIVE=+1.
TWOSAMPLE T FOR TDIFF VS S2DIFF
           N       MEAN      STDEV   SE MEAN
TDIFF     15       0.13       1.46      0.38
S2DIFF    61       0.97       1.35      0.17
90 PCT CI FOR MU TDIFF - MU S2DIFF: (-1.55, -0.12)
TTEST MU TDIFF = MU S2DIFF (VS GT): T= -2.01  P=0.97  DF=  20
```

Y

```
MTB > TWOSAMPLE 90 'TDIFF' 'S3DIFF';
SUBC> ALTERNATIVE=+1.
TWOSAMPLE T FOR TDIFF VS S3DIFF
           N       MEAN      STDEV   SE MEAN
TDIFF     15       0.13       1.46      0.38
S3DIFF    13       1.46       1.39      0.39
90 PCT CI FOR MU TDIFF - MU S3DIFF: (-2.25, -0.41)
TTEST MU TDIFF = MU S3DIFF (VS GT): T= -2.46  P=0.99  DF=  25
```

Y

```
MTB > TWOSAMPLE 90 'TDIFF' 'S7DIFF';
SUBC> ALTERNATIVE=+1.
TWOSAMPLE T FOR TDIFF VS S7DIFF
           N       MEAN      STDEV   SE MEAN
TDIFF     15       0.13       1.46      0.38
S7DIFF    33       1.24       1.41      0.25
90 PCT CI FOR MU TDIFF - MU S7DIFF: (-1.88, -0.34)
TTEST MU TDIFF = MU S7DIFF (VS GT): T= -2.47  P=0.99  DF=  26
```

Y

```
MTB > TWOSAMPLE 90 'TDIFF' 'S8DIFF';
SUBC> ALTERNATIVE=+1.
TWOSAMPLE T FOR TDIFF VS S8DIFF
           N       MEAN      STDEV   SE MEAN
TDIFF     15       0.13       1.46      0.38
S8DIFF    21       1.71       1.19      0.26
90 PCT CI FOR MU TDIFF - MU S8DIFF: (-2.36, -0.80)
TTEST MU TDIFF = MU S8DIFF (VS GT): T= -3.46  P=1.0  DF=  26
```

Y

BEST COPY AVAILABLE

```
MTB > TWOSAMPLE 90 'TDIFF' 'S9DIFF';
SUBC> ALTERNATIVE=+1.
TWOSAMPLE T FOR TDIFF VS S9DIFF
          N       MEAN      STDEV   SE MEAN                          Y
TDIFF    15       0.13       1.46      0.38
S9DIFF   12       0.42       1.44      0.42
90 PCT CI FOR MU TDIFF - MU S9DIFF: (-1.25, 0.68)
TTEST MU TDIFF = MU S9DIFF (VS GT): T= -0.50  P=0.69  DF=  23

MTB > TWOSAMPLE 90 'TDIFF' 'S10DIFF';
SUBC> ALTERNATIVE=+1.
TWOSAMPLE T FOR TDIFF VS S10DIFF
           N       MEAN      STDEV   SE MEAN
TDIFF     15       0.13       1.46      0.38                         Y
S10DIFF   13       0.08       1.04      0.29
90 PCT CI FOR MU TDIFF - MU S10DIFF: (-0.75, 0.87)
TTEST MU TDIFF = MU S10DIFF (VS GT): T= 0.12  P=0.45  DF=  25

MTB > TWOSAMPLE 90 'S4DIFF' 'S5DIFF'
TWOSAMPLE T FOR S4DIFF VS S5DIFF
          N       MEAN      STDEV   SE MEAN
S4DIFF   12       0.33       1.50      0.43                          N
S5DIFF    5      1.800      0.837      0.37
90 PCT CI FOR MU S4DIFF - MU S5DIFF: (-2.48, -0.45)
TTEST MU S4DIFF = MU S5DIFF (VS NE): T= -2.57  P=0.023  DF=  13

MTB > TWOSAMPLE 90 'S4DIFF' 'S6DIFF'
TWOSAMPLE T FOR S4DIFF VS S6DIFF
          N       MEAN      STDEV   SE MEAN
S4DIFF   12       0.33       1.50      0.43                          Y
S6DIFF   15       0.73       1.22      0.32
90 PCT CI FOR MU S4DIFF - MU S6DIFF: (-1.32, 0.52)
TTEST MU S4DIFF = MU S6DIFF (VS NE): T= -0.75  P=0.46  DF=  21
```

FEEDBACK LOOP AS A MASTERY LEARNING TEACHING CONCEPT TO IMPROVE STUDENT LEARNING

A RESEARCH PROJECT CONDUCTED BY
CAROLE JARRETT, INSTRUCTIONAL RESOURCE SPECIALIST
INCLUDING INSTRUCTORS
ROBERT THURBER, BUSINESS
SARA SONRISE, EARLY CHILDHOOD EDUCATION
DAVID PYLE, BUSINESS
SOLANO COMMUNITY COLLEGE
FALL SEMESTER 1991

OVERVIEW

Introduction

The purpose of this research project was to have community college instructors use a specific teaching concept from mastery learning theory. The particular mastery learning concept chosen by all three instructors was the "feedback loop." Students were given pre- and post-tests to measure the level of improvement of learning.

Feedback loop is a concept that enables students to find out how well they did on a test, to receive corrective activities, and then to have a "second chance" at validating their mastery of the subject matter. A second version of a post-test was provided students who did not prove mastery the first time. Those who did not achieve a pre-determined level of achievement had the option of taking a second equivalent version of the test at a time designated by the instructor. Prior to the second chance, however, the instructor provided a "corrective" which could take the form of a work sheet, tutorial assistance, video information, review material, additional reading, or other activities.

Background

In a presentation to instructors at Solano College, Carole Jarrett, the research project coordinator, invited the audience to be involved in a special research project with the Sacramento City College consortium. Her research was to focus on the impact on college students of either alignment or feedback loops as presented in mastery learning. Three instructors committed themselves to be part of the project; all happened to select to do research on feedback loops.

The three instructors were the asked to design feedback and corrective loops and to prepare summative tests to follow a unit of instruction. They were asked to construct two equivalent forms of a criterion-referenced test. Correctives were to match the learning problems identified through the feedback. Instructors were told that students could be offered a variety of alternative learning materials and activities or additional time to correct their particular learning errors.

Literature

Mastery Learning is based on ancient educational wisdom: stimulate learners with effective opportunities; engage their active participation; reinforce desirable responses; correct mistakes; and keep the goals, means, and assessments of learning well aligned. Much research that has recently been synthesized shows that when these things are done, far greater amounts of learning can be expected.[1] Omelich and Covington (1981) compared the learning retention of college students taught introductory psychology by mastery versus non-mastery procedures. They retested students four weeks after completion of the course and found a positive effect as measured by a strong correlation of .73 between mastery and a delay of a test.[2]

Measuring mastery students versus non-mastery learning students generally causes effect sizes close to 1, but often have been found up to 4 sigmas. The effects are stronger at the elementary levels, but are still significant at higher levels of education. Further, it is clear from research that the introduction of mastery learning compels many, and perhaps most, students to spend additional time in learning activities.[3]

Benjamin S. Bloom (1976) is widely viewed as the major theoretician and promulgator of mastery learning. He was followed by other researchers, most noteworthy is John Carroll. Two components of mastery learning which were presented at a special presentation at Solano's Flex Cal days are "alignment" and "feedback loops." Feedback with corrective loops are thought to be alternative learning materials and procedures which are the most powerful set of features in the Quality of Instruction as determined by Bloom.

Mueller (1976) notes that feedback with correctives need not be a drain on classroom time. Many remediation procedures can be executed outside of the classroom and without the teacher (i.e., teacher's aid tutoring, peer tutoring, alternative textual materials, workbook type exercises, programmed materials, and audio visual materials).[4]

---

[1] Walber, J.H. (1985). Examining the theory, practice, and outcomes of mastery learning. In D.V. Levine (Ed.), Improving Student Achievement Through Mastery Learning Programs, (p 1-10), San Francsico: Jossey-Bassey.

[2] Omelich, C.L. and Covinton, M.V. (1981). Do the learning benefits of behavioral instruction outweigh the psychological costs? Paper presented at the annual meeting of the Western Psychological Association, Los Angeles, CA (ERIC No. ED 213 329).

[3] Guskey, T.R. and Pigott, T.D. (1988). Research on Group-Based Learning Programs: A Meta-Analysis. Outcomes. 7(4), 30-50.

[4] Mueller, D.J. (1976) Mastery Learning: Partly Boon, Partly Boondoggle. Teachers College Record, 78, 41-52.

Problem

The focus of this project was to validate the effects of a mastery learning concept in the improvement of adult student learning at the college level. A secondary problem would be to determine any differences in effect influenced by different teachers in different programs.

Purpose

The purpose of this project is also multi-faceted. First, the results may confirm the success of mastery learning concepts at the community college level. If so, this could provide strong direction for classroom techniques. The results may also offer direction for more clarity in presenting mastery learning for varying program areas.

METHODOLOGY and FINDINGS

Case I: Robert Thurber, Business Instructor

Thurber provided two "mid-terms" in his Accounting class. He compared the results of the mid-term 1 (the experiment) with the results of the mid-term 2 (the control). Selected questions from mid-term 1 were given as a pretest for no credit. At the time of mid-term 1, there were two comparable versions of the exam. Any student not obtaining a score of 90% or higher (an A grade) was given the opportunity to review and take the second version of mid-term 1. Soon after, a pre-test for no credit was given for the information presented for mid-term 2. This second mid-term (the control) did not provide a second chance and did not have an alternate form.

The first statistical test compared the means of the two mid-term tests without the data from the "second chance" mid-term 1. The null hypothesis was that there was no difference in the means of the two tests. Since both populations qualified as large samples, the test statistic used was $z > 1.65$ ($a = 0.05$).

Table 1: Comparison of Mid-Term Scores WITHOUT a "Second Chance"

	Mid-Term 1	Mid-Term 2	z
Mean	8.79	8.75	0.07
Standard deviation	2.39	1.97	
Number	33	32	

Since the difference of 0.07 was not greater than 1.65, the null hypothesis was not rejected. There was not sufficient evidence to conclude that the mean scores of tests given to either the control group or the experimental group had any significant difference without the "second chance" possibility.

The second statistical test compared the means of the two mid-term tests with the data from the "second chance" mid-term 1. The null hypothesis was that there was no difference in the means of the two tests. Again since both populations qualified as large samples, the test statistic used was $z > 1.65$ ($a = 0.05$).

Table 2: Comparison of Mid-Term Scores WITH a "Second Chance"

	Mid-Term 1	Mid-Term 2	z
Mean	9.52	8.75	1.98
Standard deviation	1.00	1.97	
Number	33	32	

Since the difference of 1.98 was greater than 1.65, the null hypothesis was rejected. There was sufficient evidence to conclude that the mean scores of "second chance" tests is greater than the mean scores of tests that are given when "second chance" tests are not possible.

Case II: Sara Sonrise, Early Childhood Education

Sonrise had a 3-hour evening class, and each of these class sessions was a stand-alone unit. She offered (1) a post-test covering material on the previous week, (2) presentation of new material, and (3) a pre-test for material to be presented the following week. The mid-term was written to clearly identify the subject matter units. One specific unit was identified on the mid-term as a 'second chance" for the students which would replace their previous grade for that unit. This particular unit was considered the experiment.

The first statistical test compared the means of the pre-test with the unit test. The null hypotheses was that the tests were the same. Since both populations qualified as large samples, the test statistic used was $z > 1.96$ ($a = 0.05$).

Table 3: Comparison of Pre-Test to Unit Test (no "Second Chance")

	Pre-Test	Unit Test	z
Mean	0.700 (70%)	0.613 (61%)	2.13
Standard deviation	0.120	0.167	
Number	24	26	

Since the difference of 2.13 was greater than 1.96, there was sufficient evidence to conclude that the mean of the scores on the pre-test is greater than the mean of the scores on the Unit test. Reasons for this could include the level of comparable complexity between the tests as well as the difference between being presented as graded or non-graded tests.

The instructor explained that her students "froze" during the first testing opportunity. Many of them personally indicated having extreme test anxiety. This may have been one of the reasons for the drop in scores from the pre-test to the post-test. One of the benefits of mastery learning is to measure the true mastery of a subject matter with as little interference as possible from such things as test anxiety.

The second statistical test compared the means of the pre-test with the same unit score in the final. The null hypothesis was that the tests were the same. Since both populations qualified as large samples, the test statistic used was $z>1.96$ ($a=0.05$).

Table 4: Comparison of Pre-Test to Same Unit Portion of the Final (with a "Second Chance")

	Pre-Test	**Unit Portion of the Final**	**z**
Mean	**0.700 (70%)**	**0.828 (82%)**	**3.72**
Standard deviation	**0.120**	**0.123**	
Number	**24**	**26**	

Since the difference of 3.72 was greater than 1.96, there was sufficient evidence to conclude that the mean of the scores on the pre-test is less than the mean of the scores on the unit portion of the final with a second chance.

Case III: David Pyle, Business

Pyle had two classes of Business Communication. One class was at Napa Community College, and the other was at Solano Community College. The experimental group was Solano Community College Business Communication class which met MWF from 10 to 11 a.m. The Control Group was Napa Valley College Business Communications class which met TTH from 8 to 9:25 a.m.

Both classes used the same material and had the same assignments governed by the same syllabus and policies. The only exception was the experimental group policy for written assignments. This policy was that grades of "D" or "F" were omitted; if the work did not met at least a "C" standard, it would receive an "RE" grade which meant the work was unsatisfactory and needed to be redone. The students had one week to revise the work to have the "RE" grade replaced with a better grade; if not, the "RE" grade was changed to an "F".

For the first assignment the average grade for Napa was 3.89 and for Solano was 2.48. From the Solano experimental group, 12 students chose to re-do their work, and 2 did not. One the second assignment there were 8 Solano students who revised their work and 1 who chose not to do so. During the last assignment the Napa control group had average grades of 4.00 and the experimental Solano group's were 3.55. There was a 1.07 grade improvement within the Solano control class compared with a 0.11 grade improvement within the experimental Napa class.

The first statistical test compared the means of the pre-test at Solano with the means of the pre-test at Napa. The null hypothesis was that there was no difference in the means of the test scores. Since both populations qualified as large samples, the test statistic (non directional) used was $z>1.96$ ($a=0.05$).

Table 5: Comparison of the Pre-Test at Solano College with the Pre-Test at Napa College

	Solano	Napa	z
Mean	9.14	10.05	-1.33
Standard deviation	2.49	2.34	
Number	35	19	

Because $1.33 < 1.96$. the null hypothesis was not rejected. There was not sufficient evidence to conclude that the mean of the pre-test scores was different.

The second statistical test compared the mean percentages of the post-test at Solano with the mean percentages of the post-test at Napa. The null hypothesis was that the tests were the same. Since both populations qualified as large samples, the test statistic used was $z > 1.96$ ($a = 0.05$).

Table 6: Comparison of the Final Scores at Solano College with the Final Scores at Napa College

	Solano	Napa	z
Mean	**0.776**	**0.893**	**0.893**
Standard deviation	**0.146**	**0.109**	
Number	**23**	**11**	

Because $2.61 > 1.96$, the null hypothesis was rejected. There was sufficient evidence to conclude that the mean percentages on the final were significantly greater for Napa than for Solano.

There was a concern by the instructor that there was a great difference in the ability level of the two groups. He felt there was a lesser degree of maturity with the experimental Solano group. As a result, Pyle conducted a separate demographic study to determine the educational backgrounds, ages, and other potential factors that could possibly skew the results. A description of the two groups follows.

	Napa	Solano
Age Span	**20-50**	**21-40**
Education	**23% with A.A.**	**5% with B.A.** **83% with 30 units**
Outside employment	**86% work less than 10 hours per week**	**75% work 11 to 40 hours per week**
Claim financial aid	**56%**	**25%**
Involved in outside school activities	**0%**	**24%**
Head of household	**68%**	**24%**
Gender split: **Male** **Female**	 **43%** **57%**	 **16%** **84%**

The Solano experimental group appeared to be disadvantaged by being less mature, less educated, and busier outside of school; and these factors may have been distracting to the results of the study. Although the final test scores were higher in Napa, the growth of the students in Solano appeared to be greater. The gain in assignment grades by the experimental group clearly far exceeded those of the control group. The findings of this particular study would indicate that the feedback and corrective loop, or opportunity for a revision of work, improved the student's opportunity for mastery of the subject matter. Initially there was strong group discrepancy, but toward the end, the groups became close statistically in their final test scores.

Interpretation

For the first time all three instructors had an opportunity to use "feedback loop" designed for their own particular classroom needs. These experiments provided an opportunity to examine the results of three totally different uses of the concept of "second chance: when testing. Each of the experiments provided enough positive response to conclude that further research along this line could provide a positive direction to changes in classroom instruction at the community college level.

SUMMARY

Conclusions

Each of the three instructors approached the project in a professional manner and truly wanted to determine whether the concepts of mastery learning would impact student learning. The overall concept of classroom research, in this case, has certainly enabled these three instructors to consider new approaches to classroom instruction, and that alone should affirm the end goal for the project. It is reasonable to conclude that these instructors will share these results with their colleagues. This "rippling effect" will perhaps encourage others to use feedback loops and to be involved in classroom research.

Recommendations

The Project Coordinator, Jarrett, has observed each of the instructors taking great pride in their participation in the project. Each instructor has expressed enthusiasm with the mastery learning techniques. The seminar presentation at Flex Cal days at Solano Community College should be continued with more solicitation of participants.

The three participating instructors who were enlisted in this project were scheduled to present their results at an upcoming staff development seminar.

RESEARCH FACULTY COMMENTS

As part of this project this writer observed these three individuals involve themselves in classroom research following a suggested format. It also worked with other instructors from Solano College who were invited to study any classroom-oriented research. This caused us to think about the two different approaches. What kind of instructors are self-motivated enough to develop their own idea of classroom research? What kind of instructors need to be given ideas for classroom research? Have there been comparisons of the two approaches? This writer would like to pursue this further.

SACRAMENTO CITY COLLEGE

EXPANDING THE CONCEPT AND PRACTICE OF CLASSROOM BASED RESEARCH

EXHIBITS

A. Introduction Materials
    - Letter
    - Announcement
    - Application

B. List of Selected Studies

C. Worksession Agendas

D. Evaluation Instrument

E. Summary Responses
    - Evaluation Instrument

EXHIBIT A

Sacramento City College

April 3, 1991

Charles Synold, Vice President
3835 Freeport Blvd.
Sacramento, CA 95822

RE: Classroom Based Research Project

Dear Mr. Synold:

Attached please find information on opportunities for faculty to conduct classroom research during the Fall Semester 1991. The California Community Colleges State Chancellor's Office, through the Fund for Instructional Improvement, has awarded a contract to Sacramento City College to coordinate faculty directed classroom research studies in Community Colleges in Northern California.

In brief, the grant will support two faculty each from seven community colleges to participate in training sessions, conduct classroom research studies, and prepare papers on the results. The research will be directed toward assessing instructional techniques or strategies to improve instruction.

The seven colleges identified to be invited to participate include:

- American River College
- Sacramento City College
- Sierra College
- Yuba College
- Cosumnes River College
- San Joaquin Delta College
- Solano College

The grant will pay a $1,00 stipend to each participating faculty member (two per college). Colleges who wish to support more faculty in this activity are encouraged and welcome to have additional faculty attend research training sessions. Stipends for additional faculty would be the responsibility of the specific college.

Five training sessions will be conducted on Wednesday afternoons at Sacramento City College. This is an exciting opportunity for teaching faculty to share their expertise in any area of the curriculum. To participate, the selected faculty from your institution should complete the attached application form and return to Sacramento City College by May 15, 1991.

Enclosed for your review is a copy of the latest classroom research project conducted in collaboration with Irvine Valley College. If you have additional questions, please don't hesitate to contact Marguerite Jones at (916) 558-2253 or Kirk Wiecking at (916) 558-2361.

Cordially,

Kirk M. Wiecking
Instructional Developer Project Director

KMW:dlm
cc: Staff Development Officer
Research Office

3835 Freeport Boulevard, Sacramento, CA 95822
Los Rios Community College District

The Los Rios Community College District is an affirmative action equal opportunity organization.

EXHIBIT A

Sacramento City College

CONSORTIUM CLASSROOM BASED RESEARCH PROJECT

• **Introduction**	Sacramento City College, as part of an FII grant, invites you to participate in classroom based research projects as part of a seven college effort during 1991.
• **Project Intent**	To improve teaching and learning through classroom based research.
• **Project Purpose**	To study teaching methodologies and /or classroom activities that can have an impact on students. The focus of this project is on a teaching method that an instructor is already using (or may want to try) that he/she feels may improve students' chance of success. For example, conducting background knowledge probes, classroom lecture summaries, or working with classroom assessment quality circles. This is an opportunity to have such ideas put into action for validation.
• **Project Specifics**	Two instructors each from seven community colleges will work during Fall 1991 to implement classroom research to improve teaching and learning. The activity will include five workshop sessions. There will also be individualized assistance available throughout the project.
• **Faculty Selection**	Instructors will be recommended from participating colleges.
• **Application Deadline**	May 15, 1991 is the deadline for faculty applications Selected instructors will be notified by May 30, 1991.
• **Stipend**	Participants will each be awarded a $1000 stipend to compensate them for the extra time they will need to commit to the project.
• **Questions**	**For additional information, please contact:**

Marguerite Jones	Learning Resources Division	Ext. 253
Kirk Wiecking	Learning Center	Ext. 361

1st	Work session	Wednesday,	June	12, 1991
2nd	Work session	Wednesday,	August	14, 1991
3rd	Work session	Wednesday,	September	18, 1991
4th	Work session	Wednesday,	October	16, 1991
5th	Work session	Wednesday,	November	27, 1991

All workshops will be from 1:30 to 4:30 p.m.

Thank you for your interest.
Selections will be made and we will notify all applicants as soon as possible.

Supported by: The Fund For Instructional Improvement
California Community Colleges Chancellor's Office

EXHIBIT A

Sacramento City College

Consortium Classroom Based Research

PROJECT APPLICATION

College____________________ Division________________

Name____________________ Office Phone______________

Home Address____________________________________

City ______________ State__________ Zip Code__________

Home Telephone (______) __________________

The classroom-based research project requires that each faculty participant attend five training sessions, implement, evaluate, and submit a report on the classroom based research project. Briefly describe any classroom research which you would like to conduct.

Please Forward Completed Application By May 15, 1991
To Kirk Wecking, Sacramento City College, c/o Learning Resources Division
3835 Freeport Blvd., Sacramento, CA. 95822 (916) 449-7361

Supported by: The Fund For Instructional Improvement
California Community Colleges Chancellor's Office

EXHIBIT B

LIST OF SELECTED STUDIES

Behavioral and Social Science

Learning Style and the Distant Learner
Richard J. Dowdall, Psy.D.
Sacramento City College

Biology

Investigating Some Strategies To Lower Attrition in Biology
Alyce Fiedler and George Bleekman
American River College

English

Cooperative Learning in a Developmental Reading Course
William Morris
American River College

Grammar-Checking Software in the Writing Lab
Phil Hutcheon
San Joaquin Delta College

The CRC Penpal Project: Fostering Cross-Cultural Interaction
Marlo McClurg
Cosumnes River College

Underline the Subject Once; The Verb Twice
Cynthia Cilensek Kellogg
Woodland Campus Yuba College

English As A Second Language

Assigned Topics vs Student Topics: For Developing Fluency in ESL Students Under Timed Writing Conditions
Charles Honnold
American River College

Family and Consumer Science

Computer Skills in the Fashion Industry
Peggy Gorbach
Solano Community College

EXHIBIT B

Foreign Language

An Initial Investigation Into Why More African-American Students Do Not Take Foreign Language Classes
Dr. Ramiro Canto-Lugo and Matthew J. Reich, M.A.
Yuba Community College

Mathematics

Does the Graphing Calculator Enhance Learning in Precalculus?
Katherine McLain
Cosumnes River College

Laboratory Activities in Developmental Mathematics
Kent M. Neuerburg
Cosumnes River College

Physical Education

Ongoing Semester Use of the Dunham Dance Technique to Improve Student Preparedness for Dance
Shirley Brown
Sacramento City College

Dual Disciplines

English 1/History 17 Essay
Susan Messina and Diane White
Solano Community College

Mastery Learning/Teaching

Feedback Loop as a Mastery Learning Teaching Concept to Improve Student Learning
Carole Jarrett
Solano Community College

EXHIBIT C

SACRAMENTO CITY COLLEGE
FUND FOR INSTRUCTIONAL IMPROVEMENT
CLASSROOM BASED RESEARCH PROJECT

AGENDA
WEDNESDAY, DECEMBER 4, 1991 1:30PM
BUSINESS BUILDING ROOM 239

I. BUSINESS MATTERS

- Final Paper Work
- Stipends

II. UPDATE

- Project Status
- Research Faculty Comments
- Problems and Solutions

III. FINAL REPORT

- Presentation
- Statistical Treatments
- Instruments
- Participant Reports
- Hard Copy & Computer Disks
- Final Pass
- Production Schedule

IV. OTHER ISSUES

- Evaluation
- Dissemination
- Future Projects
- Research Conferences

EXHIBIT C

SACRAMENTO CITY COLLEGE
FUND FOR INSTRUCTIONAL IMPROVEMENT
CLASSROOM BASED RESEARCH PROJECT

AGENDA
WEDNESDAY, SEPTEMBER 18, 1991 1:30PM
BUSINESS BUILDING ROOM 239

I. BUSINESS MATTERS

- Stipends (Final Paper Work)
- Meeting Schedule

II. PRESENTATION

- Comments on Dr. Rasor's presentation
- Distribution of Draft Handbook

III. UPDATE

- Project Status
- Research Faculty Comments
- Problems and Solutions

IV. METHODOLOGY

- Statistical Treatments
- Instruments
- Participant Reports

V. OTHER ISSUES

- Computer Work

EXHIBIT C

SACRAMENTO CITY COLLEGE
FUND FOR INSTRUCTIONAL IMPROVEMENT
CLASSROOM BASED RESEARCH PROJECT

AGENDA
WEDNESDAY, AUGUST 14, 1991 1:30PM
BUSINESS BUILDING ROOM 107

I. UPDATE

- Project Status
- Abstracts

II. PRESENTATION

- Dr. Richard A. Rasor
- Faculty Initiated Instructional Research
- Questions and Answers

III. IMPLEMENTATION

- 1st Day Start-up
- Record Keeping
- Instruments
- Reporting

IV. BUSINESS MATTERS

- Meeting Schedule
- Stipends
- Final Report

V. OTHER ISSUES

- Learning Styles Inventory
- Research Environment

EXHIBIT C

SACRAMENTO CITY COLLEGE
FUND FOR INSTRUCTIONAL IMPROVEMENT
CLASSROOM BASED RESEARCH PROJECT

AGENDA
WEDNESDAY, JUNE 12, 1991 1:30PM
HUGHES STADIUM CONFERENCE ROOM

I. INTRODUCTIONS

- Project Staff
- Faculty Researchers

II. PROJECT INTENT

- Background
- Goals
- Objectives
- Activities
- Outcomes

III. IMPLEMENTATION STRATEGIES

- Concept Development
- Review of Literature
- Research Design
- Abstract

IV. BUSINESS MATTERS

- Roster Verification
- Meeting Schedule
- Individual Contact Sessions
- Final Report
- Stipends

V. OTHER ISSUES

Exhibit D

SACRAMENTO CITY COLLEGE
CLASSROOM BASED RESEARCH
EVALUATION

1. What is your opinion of the Classroom Based Research concept to improve teaching and learning?

Excellent Idea	Very Good Idea	Good Idea	Needs Refinement	Not Appropriate
1	2	3	4	5

2. The announcements for submitting an application to conduct Classroom Based Research were

Excellent Idea	Very Good Idea	Good Idea	Needs Refinement	Not Appropriate
1	2	3	4	5

3. The Application form to conduct a Classroom Based Research project study was

Excellent	Very Clear	Clear	Needs Improvement	Not Appropriate
1	2	3	4	5

4. The group seminars were

Extremely Helpful	Very Helpful	Helpful	Not Very Helpful	Not Appropriate
1	2	3	4	5

5. The seminars should have been conducted

Much More Frequently	More Frequently	As They Were	Less Frequently	Not at All
1	2	3	4	5

6. One to one consultations with the internal research advisor were

Extremely Helpful	Very Helpful	Helpful	Not Very Helpful	Not Appropriate
1	2	3	4	5

7. The individual sessions should have been conducted

Much More Frequently	More Frequently	As They Were	Less Frequently	Not at All
1	2	3	4	5

8. The entire project was

Very Well Organized	Well Organized	Organized	Not Very Well Organized	Not Applicable
1	2	3	4	5

9. The clerical assistant was

Excellent	Very Good	Good	Not Very Good	Not Applicable
1	2	3	4	5

10. The need for clerical assistance is

Extremely Important	Very Important	Important	Not Very Important	Not Applicable
1	2	3	4	5

11. Time provided to conduct the study was

More Than Sufficient	Very Sufficient	Sufficient	Less Than Sufficient	Not Applicable
1	2	3	4	5

12. The scope of your project was

Too Extensive	Very Extensive	Managable	Not Very Extensive	Not Applicable
1	2	3	4	5

13. Conducting classroom research is

Extremely Difficult	Very Difficult	Difficult	Not Very Difficult	Not Applicable
1	2	3	4	5

14. Your interest in this activity was

Extremely High	Very High	Average	Not Very High	Not Applicable
1	2	3	4	5

15. The potential for you to continue classroom based research study is

Extremely High	Very High	Average	Not Very High	Not Applicable
1	2	3	4	5

16. How interested do you think other faculty may be in conducting classroom research studies?

Extremely Interested	Very Interested	Interested	Not Very Interested	Not Applicable
1	2	3	4	5

17. Compared to other salary the stipend you received for your efforts was

Well Above the Norm	Above Norm	Equitable	Below Norm	Not Applicable
1	2	3	4	5

18. Would you recommend classroom based research studies be part of on-going staff development?

A Major Part	Considerable Part	Some Part	Minor Part	Not Applicable
1	2	3	4	

19. What was the most significant part of the study for you?

20. The least significant?

21. Other comments?

Exhibit E

SACRAMENTO CITY COLLEGE
CLASSROOM BASED RESEARCH
EVALUATION

1. What is your opinion of the Classroom Based Research concept to improve teaching and learning?

10	2			
Excellent Idea	Very Good Idea	Good Idea	Needs Refinement	Not Appropriate
1	2	3	4	5

2. The announcements for submitting an application to conduct Classroom Based Research were

2	5	4		
Excellent Idea	Very Good Idea	Good Idea	Needs Refinement	Not Appropriate
1	2	3	4	5

3. The Application form to conduct a Classroom Based Research project study was

2	7	4		
Excellent	Very Clear	Clear	Needs Improvement	Not Appropriate
1	2	3	4	5

4. The group seminars were

5	4	4		
Extremely Helpful	Very Helpful	Helpful	Not Very Helpful	Not Appropriate
1	2	3	4	5

5. The seminars should have been conducted

	3	10		
Much More Frequently	More Frequently	As They Were	Less Frequently	Not at All
1	2	3	4	5

6. One to one consultations with the internal research advisor were

8	3	2		
Extremely Helpful	Very Helpful	Helpful	Not Very Helpful	Not Appropriate
1	2	3	4	5

7. The individual sessions should have been conducted

	4	9		
Much More Frequently	More Frequently	As They Were	Less Frequently	Not at All
1	2	3	4	5

8. The entire project was

6	6	1		
Very Well Organized	Well Organized	Organized	Not Very Well Organized	Not Applicable
1	2	3	4	5

9. The clerical assistant was

2	2	3		6
Excellent	Very Good	Good	Not Very Good	Not Applicable
1	2	3	4	5

10. The need for clerical assistance is

4	4	4		1
Extremely Important	Very Important	Important	Not Very Important	Not Applicable
1	2	3	4	5

11. Time provided to conduct the study was

1	3	7	2	
More Than Sufficient	Very Sufficient	Sufficient	Less Than Sufficient	Not Applicable
1	2	3	4	5

12. The scope of your project was

1	2	10		
Too Extensive	Very Extensive	Managable	Not Very Extensive	Not Applicable
1	2	3	4	5

13. Conducting classroom research is

		6	7	
Extremely Difficult	Very Difficult	Difficult	Not Very Difficult	Not Applicable
1	2	3	4	5

14. Your interest in this activity was

6	4	3		
Extremely High	Very High	Average	Not Very High	Not Applicable
1	2	3	4	5

15. The potential for you to continue classroom based research study is

4	6	3		
Extremely High	Very High	Average	Not Very High	Not Applicable
1	2	3	4	5

16. How interested do you think other faculty may be in conducting classroom research studies?

1	7	4	1	
Extremely Interested	Very Interested	Interested	Not Very Interested	Not Applicable
1	2	3	4	5

17. Compared to other salary the stipend you received for your efforts was

		11	2	
Well Above the Norm	Above Norm	Equitable	Below Norm	Not Applicable
1	2	3	4	5

18. Would you recommend classroom based research studies be part of on-going staff development?

6	4		3	
A Major Part	Considerable Part	Some Part	Minor Part	Not Applicable
1	2	3	4	

19. What was the most significant part of the study for you?

See Attachment

20. The least significant?

See Attachment

21. Other comments?

See Attachment

CLASSROOM BASED RESEARCH EVALUATION

ATTACHMENT TO EXHIBIT E

19. - Testing Observations
    - Benefits to Students
    - Learning About Research
    - Positive Research Results
    - Verification of Research Question
    - Catching up on Research
    - Close Examination of Curriculum
    - Hearing About Other Projects
    - Professional Accomplishment
    - Learning Something New
    - Opportunity to Participate
    - Looking at Analysis
    - Collectively - Sharing
    - Intellectual Stimulation
    - Finding New Factors Leading to Student Success

20. - Some parts of meetings not productive

21. - Enjoyed the Project
    - Intend to do More Research
    - Learned to Improve Teaching
    - Worth the Time and Effort
    - Needed More individual consultation and Guidance
    - Great Research model
    - Valuable Experience

ERIC Clearinghouse for
Junior Colleges

SEP 25 1992